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Homemade Nest Sites for North Dakota Song Birds Volume I

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SCREECH OWL

By Terry A. Messmer and Forrest B. Lee

Life History

The screech owl is a small owl (length under 12 inches) with ear tufts and large yellow eyes. The voice is a plaintive "hoo-hoo-hoo" which is heard at night. This bird is nocturnal and occurs in two plumage phases, gray and red.

The breeding range of the screech owl extends from southern Canada to Georgia, Alabama, Tennessee, Arkansas and Oklahoma and other states. It is a year-round resident wherever it is found.

In North Dakota, the screech owl occurs mostly in the eastern half of the state including the Turtle Mountains. It is found in groves, shelterbelts, cities, towns, farms and edges of large stands of hardwoods such as in river bottoms. Screech owls are small and inconspicuous and may nest in close proximity to human habitations without being detected. In winter it may seek shelter under eaves or vestibules or in buildings.

Nesting occurs in March and April. The nest is often found in a tree cavity usually from 5 to 30 feet above the ground, such as an old woodpecker hole or a decomposed knot hole. It will also use homemade nest boxes. The clutch usually contains four or five glossy white eggs. The incubation period is 25 or 26 days. The young fly at 28 to 30 days of age. Only one brood of young is reared each year.

The screech owl feeds mainly on mice and other small mammals, as well as other items including large insects, lizards, small snakes and frogs.

General Considerations

Screech owls will accept almost any kind of nest box that they can enter, and plans are available for a number of types. Several considerations should be taken into account when deciding on what kind of nest box to build. These include size of entrance hole and interior, adequate ventilation and drainage, and the ability to open the house for examination and cleaning. The inside floor dimensions should not be smaller than 8x8 inches or an equivalent number of square inches if the floor is not square. The inside depth from bottom to top should be from 12 to 15 inches. The distance from the floor to the bottom of the entrance hole should be from 9 to 12 inches. Two or more ¼-inch ventilation holes should be drilled near the top of the front or side boards. The bottom board should have three or four ¼-inch to ⅜-inch drainage holes. The inside of the front board should be roughened for 3 inches below the entrance hole to provide footing for the young birds at the time they leave the nest. **No perch of any kind should be attached to the nest box.** Sparrows may be attracted by the perch and it is not needed by the screech owls.

Screech owls are fully satisfied with nest boxes of the simplest design, as long as the basic requirements are adhered to rather closely. The nest boxes should be made of wood. Almost any kind of wood will do, including old crates or boxes and scrap lumber which may often be obtained at little or no cost from lumber yards or building contractors. Pine lumber and exterior grade plywood of ¾-inch thickness are both excellent. (The actual thickness of 1-inch standard dimension lumber is about ¾-inch.)

The entrance may be a round hole 3 inches in diameter or an oval opening of similar size. While various kinds of screech owl nest boxes give satisfactory results, we recommend one of simple design that is easy to construct. It is the "one-board" nest box which can be made from a single 8-foot piece of 1-inch by 10-inch lumber. Following are instructions for building one of these nest boxes.

Materials Needed

- Lumber - A single piece of 1-inch by 10-inch by 8-foot standard dimension lumber. The actual width of a 10-inch board is 9 1/4 inches.
- Nails - 16 galvanized box nails.
- Hinges - Two hinges to hold top in place and allow it to be opened (use of cleat instead of hinges is optional).
- Sawdust - Amount needed to provide a depth of 3 inches in bottom of nest box.

Construction

First measure and cut pieces to proper length as follows (Figure 1):

- Front**-1 piece 9 1/4 inches by 16 inches.
- Back**-1 piece 9 1/4 inches by 22 inches.
- Sides**-2 pieces 9 1/4 inches by 16 inches with two 1/4-inch ventilation holes in each near the top.
- Floor**-1 piece 9 1/4 inches by 7 3/4 inches with four 1/4-inch drainage holes as shown.
- Roof**-1 piece 9 1/4 inches by 12 inches.

Then drill 3-inch diameter entrance hole in front piece. Center of entrance hole is 4 1/2 inches below top and 11 1/2 inches above bottom of front piece. Next, assemble and nail solidly in place all components except top piece. Now, fit top piece in place and attach with hinges or cleat. Top of box should be 4 inches below top of back piece. Two nails are driven as shown for wiring the top of the box in a closed position.

After box is completed, provide a 3-inch depth of sawdust in bottom of nest box.

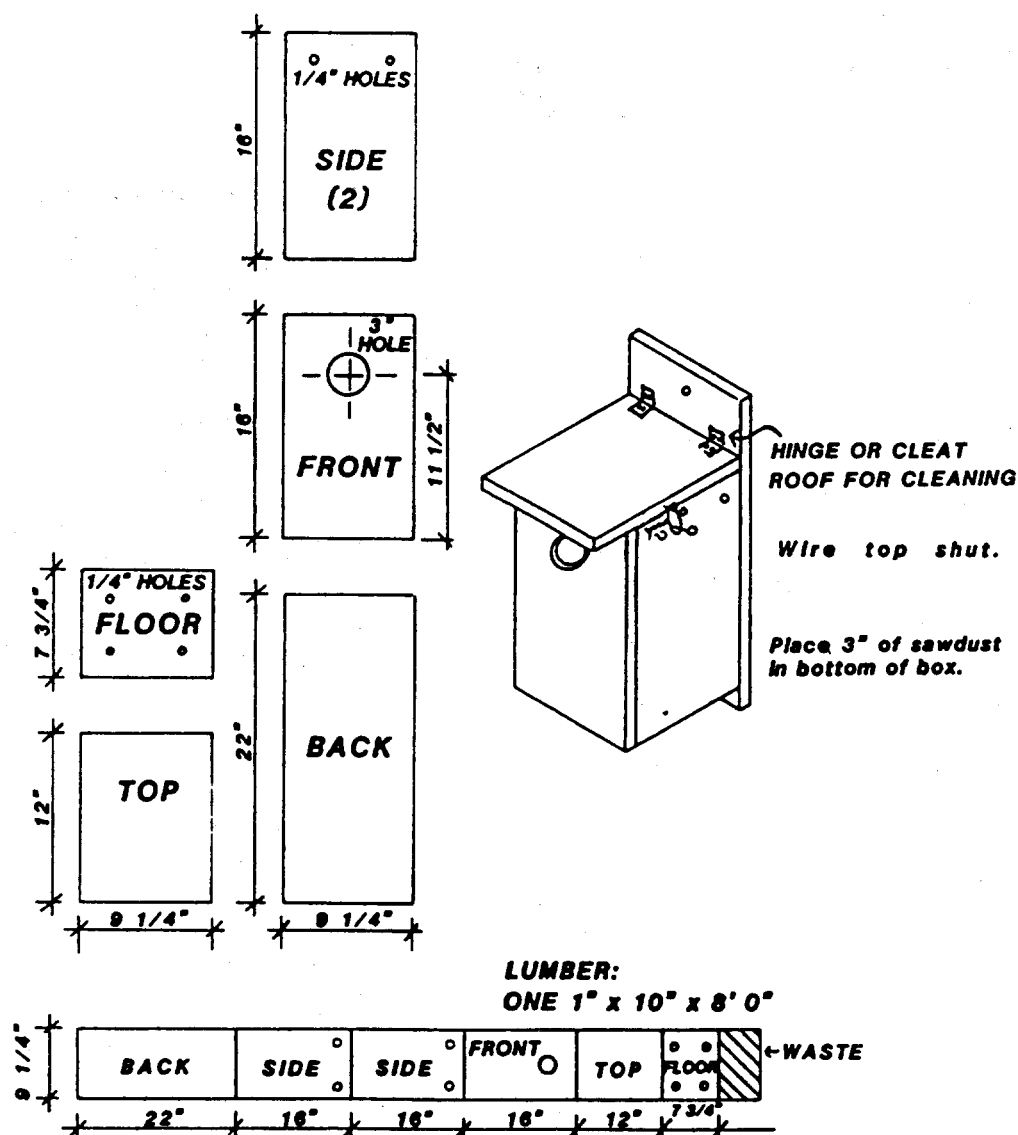


Figure 1. One-Board Screech Owl Nest Box

Mounting

Screech owl nest boxes can be mounted in several ways. They may be attached to existing wood or metal fence posts, power or telephone poles, or on wood or metal posts, or pieces of pipe used specially for this purpose.

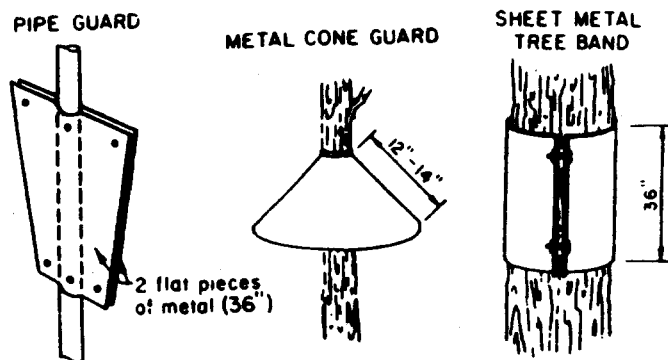


Figure 2. Nest boxes can be mounted on pipe flange assemblies. This allows for quick and easy removal for winter storage in addition to the ability to readily raise or lower nest box height.

The one-board nest box has both upper and lower extensions, and both extensions are attached to a wooden support. This nest box can also be mounted on top of a wooden fence post. Another way to mount the nest box is to place the back of the nest box against the intended support and attach the bottom extension using lag bolts. If this is done, washers should be used with the lag bolts to give the house added stability.

If the support is a metal post or pipe, the nest box can be attached in place by threading wires through the holes in the upper and lower extensions and tightening the wires so there is a firm fit. Another way is to use U-bolts which fit around the steel post and pipe, with the threaded ends extending through holes in the extensions. In this case, washers are used and the nuts are tightened so the nest box is held firmly in place.

The nest boxes are sometimes mounted on top of a length of pipe one end of which is driven into the ground far enough so the pipe is rigid. In this case a threaded pipe flange is attached to the bottom piece with bolts or screws. The end of the piece of pipe which extends above the ground is threaded, and the house and support pipe are engaged by simply screwing the end of the pipe into the pipe flange applying enough pressure so it will not work loose. Galvanized $\frac{1}{2}$ -inch or $\frac{3}{4}$ -inch water pipes provide excellent support, and pipe flanges for pipes of these sizes are readily available at hardware stores (Figure 2).

Both the upper and lower extensions can be omitted when a pipe flange will be used. Grease spread on the support pipe will keep cats, raccoons, squirrels and other animals from climbing up to the house.



The nest box may also be attached to the trunks of trees but, this method is generally considered the least desirable because of the greater danger to the nesting birds from tree-climbing animals like raccoons and cats. Squirrels will sometimes use the nest box for their home.

Electric or telephone poles when located in the right places are often suitable for mounting the nest boxes; however, permission should be obtained from the utility company before this is done. If the utility company objects to nails and screws, the houses can be easily wired to the poles.

Sheet metal collars 18 inches or more in height can be wrapped around wooden poles or posts, or even dead trees to keep tree-climbing animals from getting to the nest boxes. Suitable metal sheets can often be obtained at little or no cost from a printing office (Figure 3).

Placement

Screech owl nest boxes are best placed in wooded situations with clearings, or at the edge of woods where there are scattered clumps of trees or shrubs. Satisfactory locations include hardwoods in river bottoms, shelterbelts and farm groves.

It is recommended that the height of a screech owl nest box be from 10 to 30 feet above the ground, this distance being from the ground to the bottom of the nest box. Ten feet is a good height for ease of mounting and servicing later on. In pastures the nest boxes should be placed high enough so that livestock cannot rub on them. If possible, the entrance should face an open area, preferably in a direction away from

prevailing winds and rains. In North Dakota, screech owl nest boxes should be in place before the first of April.

Maintenance

Painting or staining will improve the appearance and life of the house even though this is not necessary. If you choose to paint or stain, use only light colors such as light brown, tan, gray or green. Dark colors may cause the interior of the nest box to get too warm on hot sunny days. Raw linseed oil helps protect the wood and results in a natural finish. The inside of the nest box and inside rim of the entrance hole should not be painted or stained. **Do not use chemical wood preservatives.**

It is important that screech owl nest boxes be built so they can be opened for inspection or cleaning. The one-board house has this feature. Make sure that the interior of the nest box is free of nest material or other debris in late March or early April prior to the nesting season. Screech owls, squirrels or mice may use the nest boxes in winter.

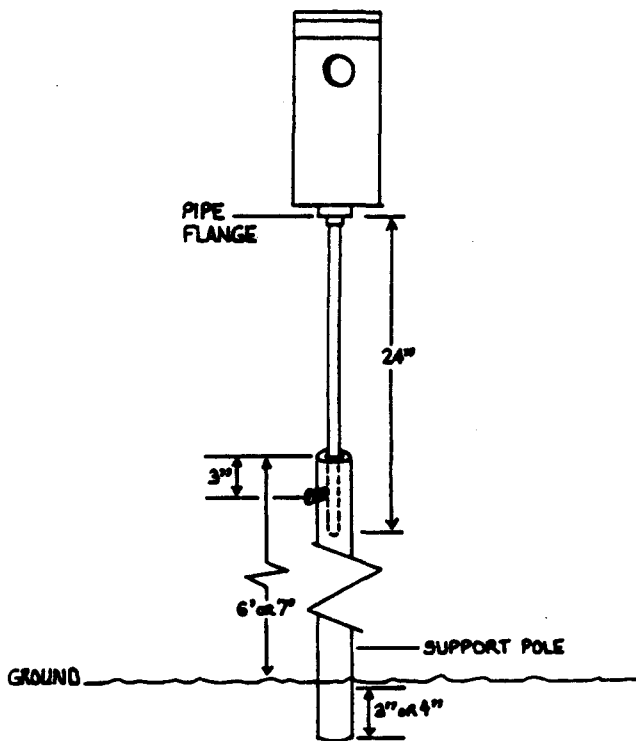


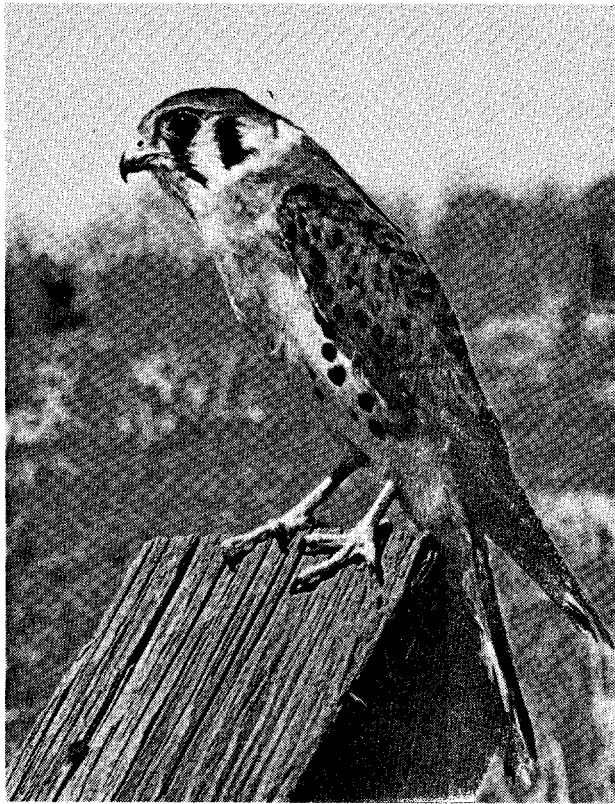
Figure 3. There are a number of ways to "predator proof" your homemade nest boxes. Above are examples of three of the more successful techniques.

Conclusion

The screech owl is a very interesting bird, even though it is quite secretive and is less conspicuous than some of the other species that use nest boxes. One might open the nest box a crack to peek in to see if a screech owl is making its home there. If so, then by watching carefully during early morning or late evening hours, you will be able to see it come or go.

References and Other Sources of Information on Screech Owls

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Sparrow Hawk (Kestrel)

by **Terry A. Messmer** and **Forrest B. Lee**
 Photos by **Leonard Lee Rue III** and **Fred Tilly**

Life History

The sparrow hawk, also known as the American kestrel, is a small robin-sized hawk. It belongs to the group known as the falcons, which are characterized by long pointed wings and long tails. The slim wings are adapted for speed and the wing-strokes are rapid. It often hovers over one spot by beating its wings rapidly. It usually perches on a pole or dead stub overlooking an open grassy area. The call note is a rapid "killy, killy, killy."

The sparrow hawk has rufous-red upperparts and tail. The male has blue-gray on the wings. Both sexes have a black and white face pattern.

It breeds from the Rockies east to Quebec and Newfoundland, and south to Florida and the Gulf of Mexico. It winters in the southern part of the breeding range south to Central America and Panama.

The sparrow hawk is relatively common throughout North Dakota. It is often found where scattered trees adjoin large areas of open country, including grasslands and croplands.

The nest is usually found in a cavity located in a tree, post or pole but occasionally it will nest in rock crevices or other places. Woodpecker holes in a wide variety of hardwood trees seem to be preferred nest

sites. The nesting cavity is from eight to 30 feet above the ground. Sparrow hawks may use cavities with entrances as small as 3 inches in diameter.

The sparrow hawk is an early spring migrant, often arriving in March. The nesting period is from late April to July. The clutch contains four or five small white brown spotted eggs. The incubation period is 29 or 30 days and the female does most of the incubating with the male doing most of the food gathering. Only one brood of young is reared each year.

The food of the sparrow hawk includes mice, grasshoppers, snakes, beetles, lizards, crickets and dragonflies.

General Considerations

Sparrow hawks will accept almost any kind of nest box that they can enter, and plans are available for a number of types. Several considerations should be taken into account when deciding on what kind of nest box to build. These include: size of entrance hole and interior, adequate ventilation and drainage, and the ability to open the nest box for examination and cleaning. The inside floor dimensions should not be smaller than 8×8 inches or an equivalent number of square inches if the floor is not square. The inside

depth from the floor to the bottom of the entrance hole should be from 9 to 12 inches. Two or more $\frac{1}{4}$ -inch ventilation holes should be drilled near the top of the front or side boards. The bottom board should have three or four $\frac{1}{4}$ inch or $\frac{3}{16}$ inch drainage holes. The inside of the front board should be roughened for 3 inches below the entrance hole to provide footing for the young birds at the time they leave the nest. No perch of any kind should be attached to the nest box. Sparrows may be attracted by the perch and it is not needed by the sparrow hawks.

Sparrow hawks are fully satisfied with nest boxes of the simplest design, as long as the above mentioned basic requirements are adhered to rather closely. Nest boxes can be made out of almost any kind of wood, including old crates or boxes and scrap lumber which may often be obtained at little or no cost from lumber yards or building contractors. Pine lumber and exterior grade plywood of $\frac{3}{4}$ inch thickness are both excellent. (The actual thickness of 1 inch standard dimension lumber is about $\frac{3}{4}$ inch.)

The entrance may be a round hole 3 inches in diameter or an oval opening of similar size. While various kinds of sparrow hawk nest boxes give satisfactory results, we recommend one of simple design that is easy to construct. It is the "one-board" nest box which can be made from a single 8 foot piece of 1-inch by 10-inch lumber. Following are instructions for building one of these nest boxes (Figure 1).

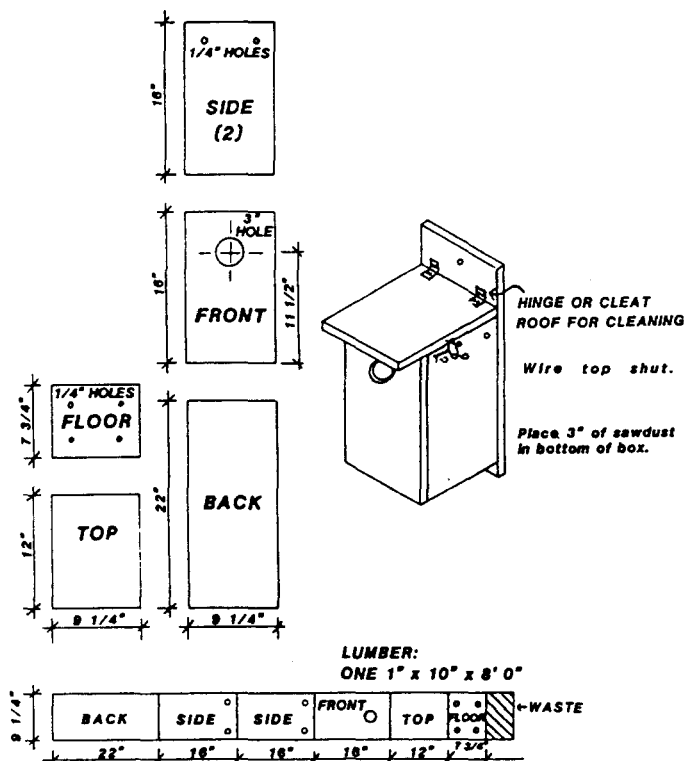


Figure 1. One-Board Sparrow Hawk Nest Box

Materials Needed

Lumber – One piece of 1-inch by 10-inch by 8-foot standard dimension lumber. The actual width of the 10-inch board is $9\frac{1}{4}$ inches.

Nails – About 16 galvanized box nails.

Hinges – Two hinges to hold top in place and allow it to be opened (use of cleat instead of hinges is optional).

Sawdust – Amount of sawdust needed to provide a depth of three inches in bottom of nest box.

Construction

First measure and cut pieces to proper length as follows (Figure 1):

Front – One piece $9\frac{1}{4}$ inches by 16 inches.

Back – One piece $9\frac{1}{4}$ inches by 22 inches.

Sides – Two pieces $9\frac{1}{4}$ inches by 16 inches with two $\frac{1}{4}$ -inch ventilation holes in each near the top.

Floor – One piece $9\frac{1}{4}$ inches by $7\frac{3}{4}$ inches with four $\frac{1}{4}$ -inch drainage holes as shown.

Roof – One piece $9\frac{1}{4}$ inches by 12 inches.

Next drill 3 inch diameter entrance hole in front piece, centering the entrance hole $4\frac{1}{2}$ inches below top and $11\frac{1}{2}$ inches above bottom of front piece.

Now assemble and nail solidly in place all components except top piece.

Then fit top piece in place and attach with hinges or cleat. Top of box should be 4 inches below top of back piece.

Lastly, two nails are driven as shown for wiring the top of the box in a closed position.

After the box is completed place 3 inches of sawdust in bottom of nest box.

Mounting

Sparrow hawk nest boxes can be mounted in several ways. They may be attached to existing wood or metal fence posts, power or telephone poles, or on wood or metal posts, or pieces of pipe used specially for this purpose.

The one-board nest box has both upper and lower extensions, and both extensions are attached to a wooden support. This nest box can also be mounted on top of a wooden fence post. Another way to mount the nest box is to place the back of the nest box against the intended support and attach the bottom extension using lag bolts. If this is done,

washers should be used with the lag bolts to give the nest box added stability.

If the support is a metal post or pipe, the nest box can be attached in place by threading wires through holes in the upper and lower extensions and tightening the wires so there is a firm fit. Another way is to use U-bolts which fit around the steel post and pipe, with the threaded ends extending through holes in the extensions. In this case washers are used and the nuts are tightened so the nest box is held firmly in place.

The nest boxes are sometimes mounted on top of a length of pipe, one end of which is driven into the ground far enough so the pipe is rigid. In this case a threaded pipe flange is attached to the bottom piece with bolts or screws. The end of the piece of pipe which extends above the ground is threaded, and the house and support pipe are engaged by simply screwing the end of the pipe into the pipe flange, applying enough pressure so it will not work loose. Galvanized $\frac{1}{2}$ -inch or $\frac{3}{4}$ -inch water pipes provide excellent support, and pipe flanges for pipes of these sizes are readily available at hardware stores (Figure 2).

Both the upper and lower extensions can be omitted when it is planned that a pipe flange will be used. Grease spread on the support pipe will keep cats, raccoons, squirrels and other animals from climbing up to the house.

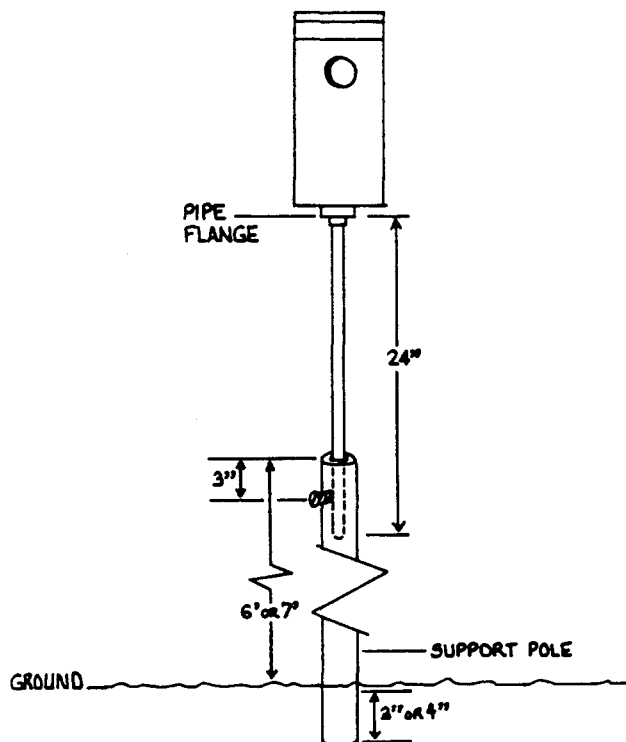
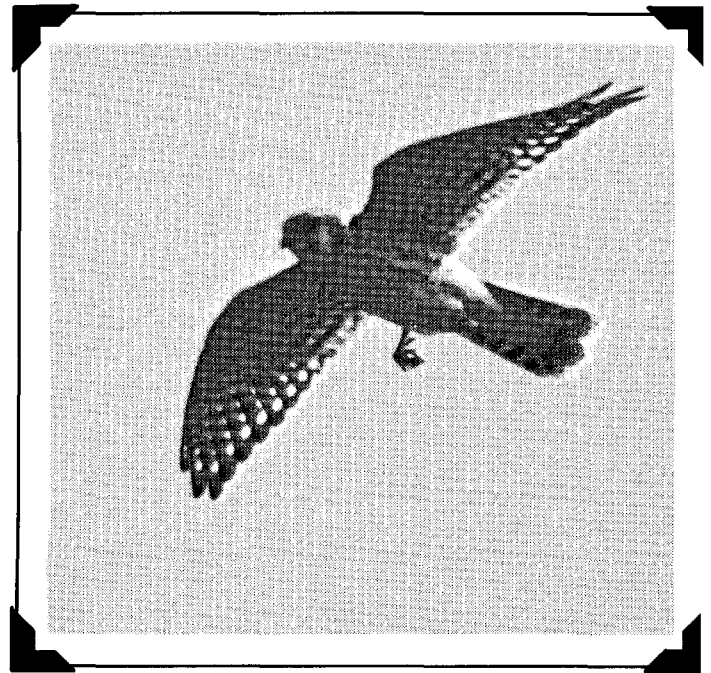


Figure 2. Nest box can be mounted on pipe flange assemblies. This allows for quick and easy removal for winter storage in addition to the ability to readily raise or lower nest box height.



The nest boxes may also be attached to the trunks of trees, but this method is generally considered the least desirable because of the greater danger to the nesting birds from tree-climbing animals like raccoons and cats. Squirrels sometimes enlarge the entrance holes and use the nest box for their home.

Electric or telephone poles, when located in the right places, are often suitable for mounting the nest boxes; however, permission should be obtained from the utility company before this is done. If the utility company objects to nails and screws, the nest boxes can be easily wired to the poles.

Sheet metal collars, 18 inches or more in height, can be wrapped around wooden poles or posts or even dead trees to keep tree-climbing animals from getting to the bird nest boxes. Suitable metal sheets can often be obtained at little or no cost from a printing plant (Figure 3).

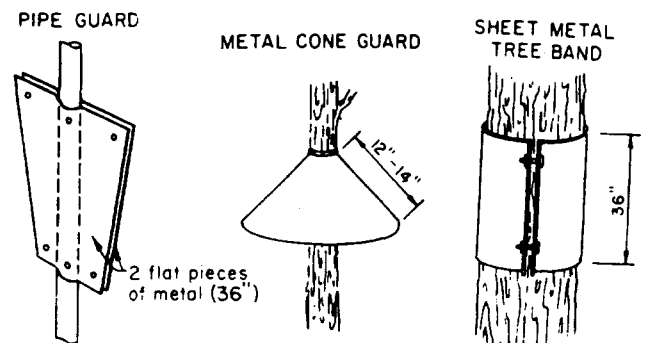


Figure 3. There are a number of ways to "predator proof" your homemade nest box. Above are examples of three of the more successful techniques.

Placement

Sparrow hawk nest boxes are best placed on a post, pole or tree in fairly open unshaded situations. They prefer habitats characterized by scattered woodlots, shelterbelts, highway rights-of-way, pastures and hay fields. They have been known to nest in boxes placed high on old barns and silos.

Recommended height of a sparrow hawk nest box is from 10 to 30 feet above the ground, this distance being from the ground to the bottom of the house. Ten feet is a good height for ease of mounting and servicing later on. In pastures the nest boxes should be placed high enough so that livestock cannot rub on them. When a utility pole is used as the support, the nest box may be attached on the east or northeast side of the pole to get some protection from the afternoon sun. If possible, the entrance should face an open area, preferably in a direction away from prevailing winds and cold rains. In North Dakota, sparrow hawk nest boxes should be in place before the first of April.

Maintenance

Painting or staining will improve the appearance and life of the nest box even though this is not necessary. If you choose to paint or stain, use only light color such as light brown, tan, gray or green. Dark colors may cause the interior of the house to get too warm on hot sunny days. Raw linseed oil helps protect the wood and results in a natural finish. The inside of the nest box and inside rim of the entrance hole should not be painted or stained. Do not use chemical wood preservatives.

It is important that sparrow hawk nest boxes be built so they can be opened for inspection or cleaning. The one-board nest box has this feature. Make sure that the interior of the nest box is free of nest material or other debris in late March or early

April, prior to the nesting season. Squirrels or mice may use the nest box in winter. To prevent this, the nest box door can be left open during winter, but if this is done one must be sure to close it before the nesting season. The life of a nest box can be enhanced if you remove and store the nest box rather than leaving it exposed to winter weather.

Discussion

The sparrow hawk is one of our most interesting birds. If you should be so fortunate as to have a pair nest in a box you put up, observing them will afford you countless hours of pleasure. It will enable you to watch them come and go as they tend the young, and perform many other fascinating antics like hovering in the air.

References and Other Sources of Information on Sparrow Hawks

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- Stewart, R.E. 1975. Breeding Birds of North Dakota. Tri-College Center for Environmental Studies, Fargo, North Dakota. 295 pp.



Pileated Woodpecker

by **Terry A. Messmer** and **Forrest B. Lee**
 Photos by **Irene Vandermolen**

Life History

The pileated woodpecker is the largest woodpecker found in North Dakota. It appears to be about the size of a crow and weighs 10 ounces or more. It is predominantly black with a scarlet crest on the head and white wing patches. It has a distinctive undulating flight pattern and appears as a dark bird with white on the wings. Its call is loud and harsh, and it also can be recognized by a loud drumming sound made by striking tree trunks with its bill.

It is a bird of the hardwood forests of eastern Canada and United States. It is found from Manitoba east to New Brunswick and Nova Scotia, and south to Michigan, Pennsylvania and Illinois. It was a very common bird before the cutting of heavy timber but now has become quite rare in many areas.

In North Dakota, it is found in the extreme eastern part of the state in wooded bottomlands of the Red, Park, Tongue, Pembina and Sheyenne Rivers. Sightings have been in extensive, mature stands of timber which include elm, ash, basswood, hackberry and other deciduous species.

The pileated woodpecker is a permanent resident wherever it is found, and it maintains the same

territory year after year. Its nesting cavity is usually in dead stubs of living trees, but may also be in living trees with a trunk diameter of 15 or more inches. The entrance hole may be from 18 to 75 feet above the ground.

The nesting period commences in May. The clutch usually contains from three to five glossy white eggs. The incubation period is about 18 days. The male assists with incubation. Only one brood is reared each year. The young are able to fly at about 26 days of age at which time they leave the nesting cavity. The parents may care for the young for a time after they leave the nest.

The food of pileated woodpeckers is largely wood-boring beetles and their larvae, ants, and other insects. Its long and worm-like tongue with a specialized pointed tip enables it to extract wood-boring beetles and their larvae from within a tree trunk. The tongue is also coated with a sticky saliva for removing ants from their holes in the ground or in rotten logs. This woodpecker has a powerful chisel-like bill for cutting large square holes in both live and dead wood in its search for food. The pileated woodpecker also eats some seeds including acorns.

We may be able to help pileated woodpeckers by providing nest boxes for them in hardwood forests that are found on the floodplains of rivers in eastern North Dakota.

General Considerations

The pileated woodpecker has not been known to nest in nesting boxes, probably because it instinctively excavates its own nesting cavity. It is believed, however, that a recent breakthrough in attracting flickers to use nest boxes may apply to pileated woodpeckers also. The technique is to fill the nest box with sawdust all the way to the top and tamp it in. Then the woodpecker can fulfill its instinct to make its own nest cavity by pecking at the sawdust.

The recommended nest box has a simple design and is easy to construct from a single, standard dimension 2-inch by 12-inch by 12-foot cedar board. This "one-board" nest box has a flat roof and a round 4-inch diameter entrance hole. The top is hinged to allow filling with sawdust. Following are instructions for building and placing this nest box.

Materials Needed

Lumber – one piece of 2-inch by 12-inch by 12-foot standard dimension cedar lumber. The actual width of a 12-inch board is 11 $\frac{1}{4}$ inches and the thickness of the board is 1 $\frac{1}{2}$ inches.

Hardware Cloth – A 16-inch by 3-inch strip of $\frac{1}{4}$ -inch mesh hardware cloth.

Hinges – Two small hinges.

Nails – About 24 galvanized box nails.

Sawdust – Enough sawdust to fill the interior of the box to the top.

Construction

Measure and cut pieces to proper length as follows (Figure 1):

Front – 1 piece 11 $\frac{1}{4}$ -inch by 24-inch.

Back – 1 piece 11 $\frac{1}{4}$ -inch by 32-inch.

Sides – 2 pieces 11 $\frac{1}{4}$ -inch by 24-inch.

Floor – 1 piece 11 $\frac{1}{4}$ -inch by 8 $\frac{1}{4}$ -inch.

Roof – 1 piece 11 $\frac{1}{4}$ -inch by 16-inch.

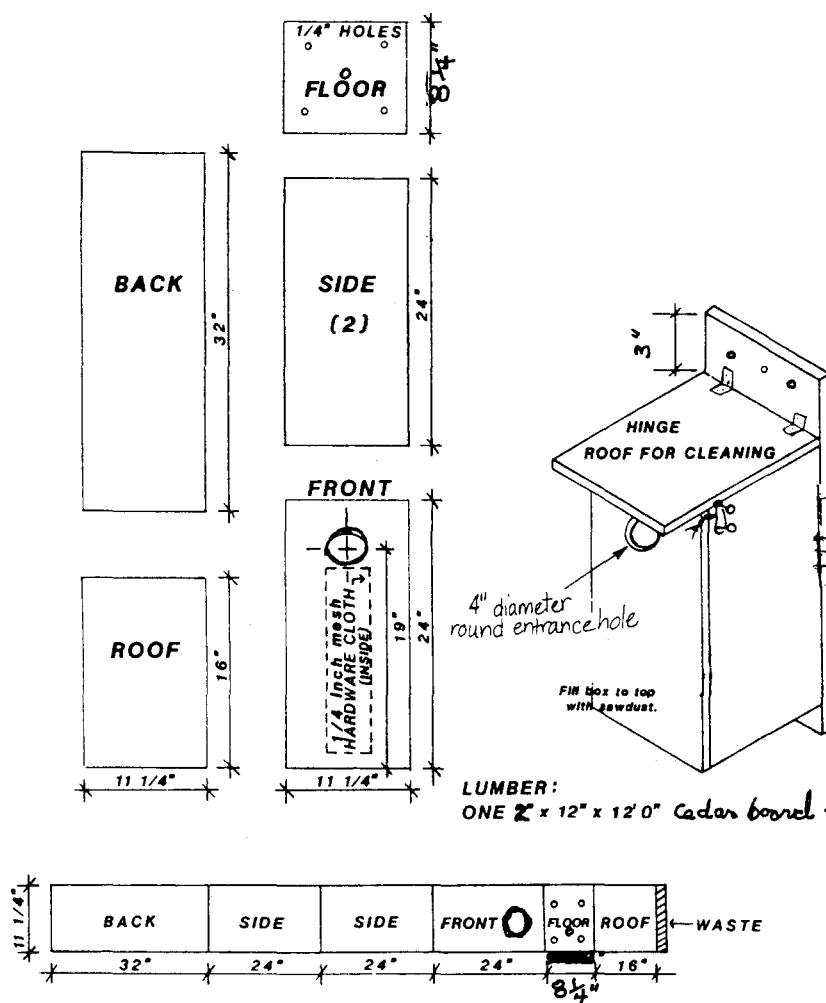


Figure 1. Plan for One-Board Pileated Woodpecker Nest Box

Next, drill 4-inch diameter entrance hole in front piece. The top of this entrance hole is 3 inches below top of front piece. The bottom of entrance hole is 17 inches above bottom of front piece. Center of entrance hole is 19 inches above bottom of front piece.

Then, drill five 1/4-inch drainage holes in floor piece as is shown in plan.

Attach the strip of 1/4-inch mesh hardware cloth on inner side of front piece as is shown on the plan. This can be done with tacks or small staples. The cut edges of the hardware cloth should be folded under so they will not cause injury to the pileated woodpeckers.

Now, assemble and nail solidly in place all components except the top. The floor is recessed 1/4 inch above the level of the bottom. The bottom of the entrance hole is about 15 1/4 inches above the floor on the inside.

The extensions of back piece should extend about 3 inches above and below box proper. Drill one or more 1/8-inch holes in top and bottom extensions to facilitate attachment to tree, pole or other support.

Install roof piece in place by attaching hinges to roof piece and back piece with small screws or nails.

The roof is held in a closed position by driving two roofing nails with large heads and wrapping a piece of wire around them as is shown in the diagram.

Sawdust is tamped firmly into the box all the way to the top. The roof is wired in the closed position and the nest box is now ready to be put up.

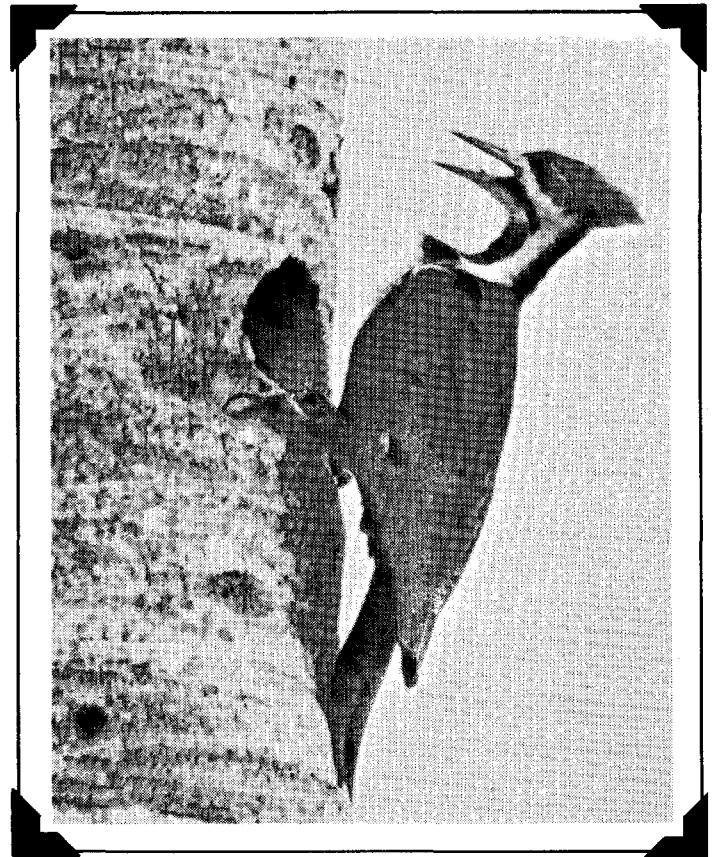
Mounting

The one-board nest box is attached to a wood support with either nails or lag screws and washers through the upper and lower extensions. Small holes drilled through the extensions make it easier to start the nails or lag screws without cracking the board. The nest box is held in the desired position while a hammer or wrench is used to anchor it firmly in place.

Sheet metal collars 18 inches or more in height can be wrapped around wooden poles or posts or even dead trees to keep climbing animals from getting to the nest box. Suitable metal sheets can often be obtained at little or no cost from a printing plant (Figure 2).

Placement

Pileated woodpecker nest boxes are best placed about 20 to 30 feet high on live or dead hardwood trees in the interior of stands of mature hardwoods.



Suitable sites may be found in extensive wooded bottomlands along rivers in eastern North Dakota. Another rule of thumb is to place nest boxes in suitable locations in localities where pileated woodpeckers have been known to occur.

Wood power or telephone poles when located in or near stands of timber may be suitable placement sites for these nest boxes, however, permission should be obtained from the utility company before this is done. If a utility company objects to nails and screws, the houses can be easily wired to the poles.

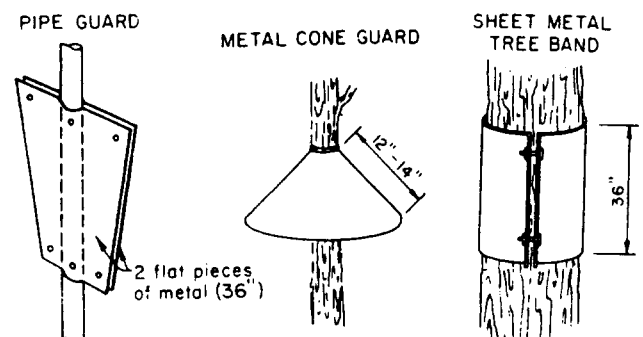


Figure 2. There are a number of ways to "predator proof" your homemade nest box. Above are examples of three of the more successful techniques.

Maintenance

Painting or staining will improve the appearance and life of the nest boxes even though this is not necessary. If you choose to paint or stain, use only light color such as light brown, tan, gray or green. Dark colors may cause the interior of the nest box to get too warm on hot sunny days. Raw linseed oil helps protect the wood and results in a natural finish. The inside of the nest box and inside rim of the entrance hole should not be painted or stained. Do not use chemical wood preservatives.

It is important that pileated woodpecker nest boxes be opened for inspection or cleaning in late winter before the nesting season. At this time the nest box should be refilled with sawdust if necessary. The life of a nest box can be enhanced if you remove and store the nest box rather than leaving it exposed to winter weather.

Discussion

The pileated woodpecker is a very spectacular bird and it is an exciting experience just to see one. It has not been known to nest in nesting boxes, but there is good reason to predict that it will do so if the box is packed with sawdust and placed in the right situation. We believe it is well worth trying in areas where this species may occur. If you are successful in

having pileated woodpeckers use a nest box, this is exciting news which should be shared with North Dakota's Extension Wildlife Specialist whose address is among the list of references which follows.

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NORTHERN FLICKER

By Terry A. Messmer and Forrest B. Lee

Life History

The Northern flicker is the most common woodpecker found in North Dakota. It is a medium-sized brownish bird with dark barring on the back. The flicker has a white rump, yellow or red on the wings and tail, a brown throat, a black crescent on the breast and black spots on the under-side. The adult male has black "mustache" feathering on each side of the face and throat. Originally, these birds were called yellow-shafted and red-shafted flickers, depending on whether the feathering on the wings and tail were yellow or red. Most of the flickers found in North Dakota are the yellow-shafted but some red-shafted flickers or hybrids of the two are found in the western part of the state.

Flickers are very active during the nesting season. At times they seem to be playing hide and seek around trunks of trees, while calling and scolding loudly. One call seems to say "flick-ah, flick-ah" and another "wick, wick, wick." They are persistent drummers and seem to derive much pleasure in pounding on tin roofs or other surfaces to produce noise at dawn.

Flickers nest from northern Alaska and Canada east of the Rocky Mountains south into the northern and central United States. They winter in the southern states, including those along the gulf coast and southern Texas. In the southern part of the breeding range some flickers are year around residents.

In North Dakota, the flicker is an early migrant which often arrives in April. It is a common summer

resident which nests throughout the state in suitable habitats. Its habitat requirements are very diverse and it is found in many environments including open woodlands, shelterbelts, orchards, woodlots, cities, towns and farmsteads. It seems to favor open country over dense forests.

The nest is in a cavity in a tree, pole or post. Nests have been found from 2 to 60 feet above ground, but sites near the top of dead tree stubs 15-20 feet high seem to be preferred. The nests are usually in dead trees or trees with dead centers. Deciduous trees are preferred to conifers. The diameter of the nesting hole entrance is usually about 3 inches, and the diameter of the interior cavity may be about 8 inches. The bottom of the nest cavity may contain wood chips. It is believed that most of the work of excavating a nesting cavity is done by the male.

In North Dakota Flickers nest from mid-May to early July. From seven to nine glossy white eggs are laid and then incubated for 11 to 12 days. Only one brood is reared each year and both parents care for the young. The young are fed by regurgitation of food from the parents. The young leave the nest at 25 to 30 days of age when they are capable of short flights. The parents may continue to care for the young even after they have left the nest.

Much of the food of flickers is comprised of ants, grasshoppers, crickets and other insects. Ants are a preferred food. Flickers are commonly seen on city lawns probing for ants. Their tongue is specially adapted for reaching into ant holes for the ants. It is

long and worm-like with a tip that is pointed, somewhat barbed, and coated with a sticky saliva.

Flickers use nest boxes provided for them.

General Considerations

Northern Flickers instinctively excavate their own nesting cavities, and until recently have not readily used nest boxes. The breakthrough for attracting flickers to use nest boxes is to fill the box with sawdust all the way to the top and tamp it firmly in place. Then the flicker can fulfill its instinct to make its own nest cavity by pecking at the sawdust.

Factors to consider when deciding on what kind of nest box to build for flickers include the size of entrance hole and interior, adequate ventilation and drainage, and the ability to open the house for examination and cleaning. The recommended inside floor dimensions are from 4×7 inches to 7×7 inches. The inside depth from bottom to top should be from 16 to 24 inches. The distance from the floor to the bottom of the entrance hole should be from 14 to 18 inches on the inside. Two or more $\frac{1}{4}$ -inch or $\frac{3}{16}$ -inch drainage holes should be drilled in the bottom. **No perch of any kind should be attached to the nest box.**

Flicker nest boxes should be made of wood. Almost any kind of wood will do, such as that from old crates or boxes and scrap lumber which is often available at little or no cost to the lumber yards or building contractors. Cedar, pine lumber and exterior grade plywood of $\frac{3}{4}$ -inch thickness are excellent. (The actual thickness of 1-inch standard dimension lumber is about $\frac{3}{4}$ -inch.)

The nest box we recommend has a simple design and is easy to construct from a single board 2 inches by 8 inches by 12 feet. This "one-board" nest box has a flat roof and a round $2\frac{1}{2}$ -inch diameter entrance hole. The top is hinged to allow filling with sawdust. Following are instructions for building and placing flicker nest boxes.

"One-Board" Northern Flicker Nest Box

Materials Needs

- Lumber - A piece of standard dimension lumber, cedar, pine or redwood, 2"×8"×12'.
The actual width of this type of board is $7\frac{1}{4}$ ".
- Nails - (about 20) - Galvanized or rosin coated of sufficient size to reach through the 2" boards into the adjacent component. Two smaller nails for wiring the box shut.
- Sawdust - Amount needed to fill box.

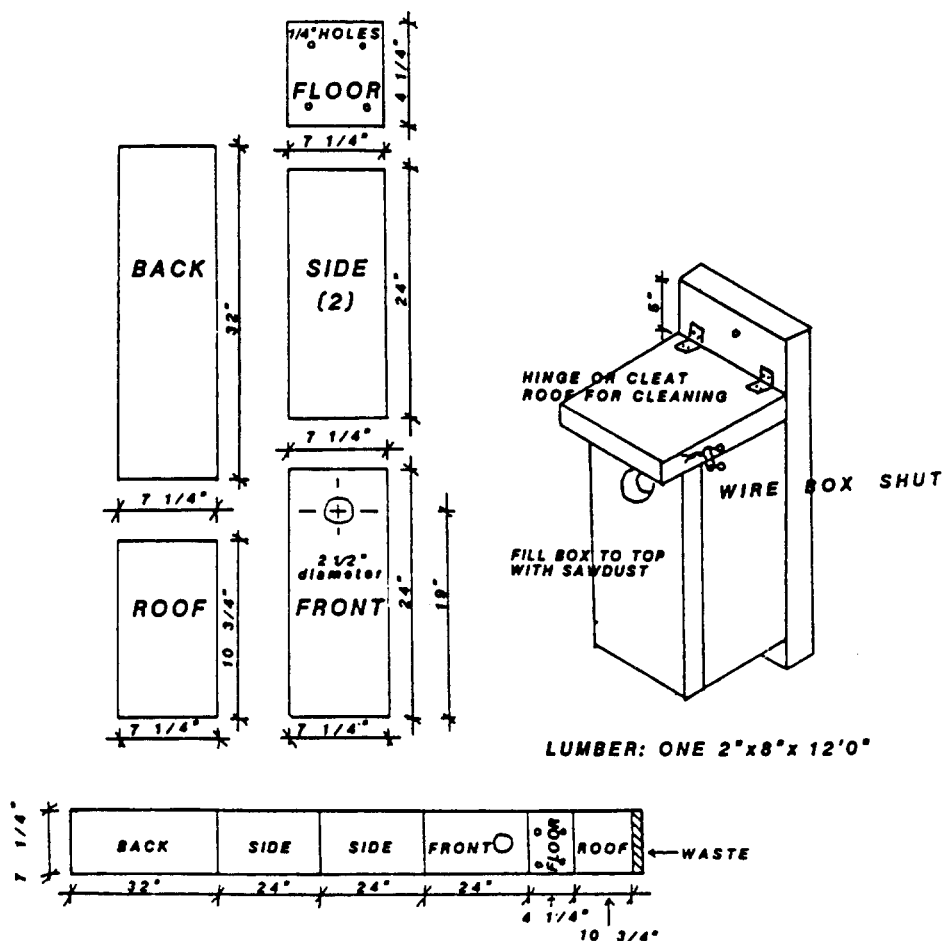


Figure 1. Plan for One-Board Northern Flicker Nest Box

Construction

The board is cut as shown to provide the six components of the house which are as follows (Figure 1):

Back - 1 piece, $7\frac{1}{4}" \times 32"$.

Side - 2 pieces, $7\frac{1}{4}" \times 24"$.

Floor - 1 piece, $4\frac{1}{4} \times 7\frac{1}{4}"$ with four $\frac{1}{4}"$ drainage holes drilled as shown in the plan.

Roof - 1 piece, $7\frac{1}{4}" \times 10\frac{3}{4}"$.

Front - 1 piece, $7\frac{1}{4}" \times 24"$ with $2\frac{1}{2}"$ diameter entrance hold the center of which is 5" below the top end of the piece.

Hinges - 2 hinges to hold top piece in place and allow it to be opened for cleaning or inspecting nest box.

First cut the pieces according to the plan, then nail the front, side and bottom pieces in place. It is advisable to drill small holes for starting the nails in order to avoid splitting the wood. Then nail this assembly to the back piece, allowing a 5 inch space from the top of the box to the top of the back piece. The last step is to install the roof using either hinges or a wooden cleat. Two nails can be driven in as shown in Figure 1, for wiring the top of the box in the closed position.

Painting will improve the appearance and life of the house even though this is not necessary. Use only light colored paint or stain, such as light brown, tan, gray or green. Dark colors may cause the interior of the nest box to get too warm on hot sunny days. A 1:1 mixture of raw linseed oil and turpentine helps protect the wood and results in a natural finish. The inside of the nest box and inside rim of the entrance hole should not be painted. **Do not use chemical wood preservatives.**

Mounting the Nest Box

The flicker box has a top extension of the back piece about 5 inches long which is used for attaching the nest box to a support. The back of the nest box can be placed against a wood post or pole and the nest box is secured in place with nails or lag screws through the top extension.

If the support is a metal post or pipe, the nest box can be attached in place by threading wires through holes in the upper extension and tightening the wires so there is a snug fit. Another way is to use U-bolts which fit around the steel post and pipe, with threaded ends extending through holes in the upper extension. In this case washers are used and the nuts are tightened so the nest box is held firmly in place.

The flicker box can also be mounted on top of a length of pipe one end of which is driven into the ground far enough so the pipe stands rigidly in place. When this method is used, a threaded pipe flange is attached to the bottom of the house with bolts or screws (Figure 2). The upper end of the pipe is threaded and is engaged with the flicker box by simply screwing the end of the pipe into the pipe flange applying enough pressure so it will not work loose. Galvanized $\frac{1}{2}$ -inch or $\frac{3}{4}$ -inch water pipes provide excellent support and pipe flanges for pipes of

these sizes are readily available at hardware stores. The upper extension of the back piece can be omitted if a pipe flange is used.

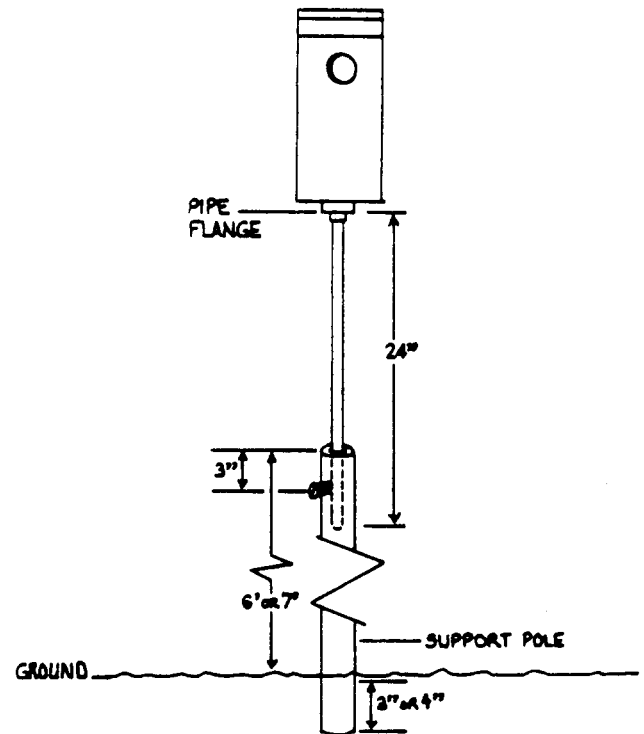


Figure 2. Nest boxes can be mounted on pipe flange assemblies. This allows for quick and easy removal for winter storage in addition to the ability to readily raise or lower nest box height.

Flicker nest boxes may also be attached to the trunks of trees, but this method is generally considered the least desirable because of the greater danger to the nesting birds from tree-climbing animals like raccoons and cats.

Electric or telephone poles when located in the right places are often suitable for mounting flicker nest boxes; however, permission should be obtained from the utility company before this is done. If the utility company objects to nails or lag screws, the houses can be easily wired to the poles.

Sheet metal collars 18 inches or more in height can be wrapped around wooden poles or posts or even dead trees to keep tree-climbing animals from getting to the nest boxes. Suitable metal sheets can be obtained at little or no cost from a newsprint office. Figure 3 demonstrates other techniques that can be used to predator proof your nest box.

Placement

Nest boxes for flickers can be placed in a wide variety of situations ranging from open areas to woodland clearings or the edge of golf courses, cemeteries, parks and residential areas. Fence rows or shelter belts bordering croplands or pastures provide

excellent places for the nest boxes. The boxes should be at least 200 yards apart.

The nest boxes can be placed from 4 to 30 feet above the ground, but it is advisable to use a height from 4 to 12 feet for ease of cleaning and servicing.

The box should be mounted in place before April 1 so it is ready for the flickers when they arrive. The interior of the nest box should be filled all the way to the top with sawdust, and then the sawdust should be tamped solidly in place. The filled box simulates a dead tree with rotted wood in the center. The flicker will start pecking at the entrance hole and throw out sawdust until a suitable cavity is formed.

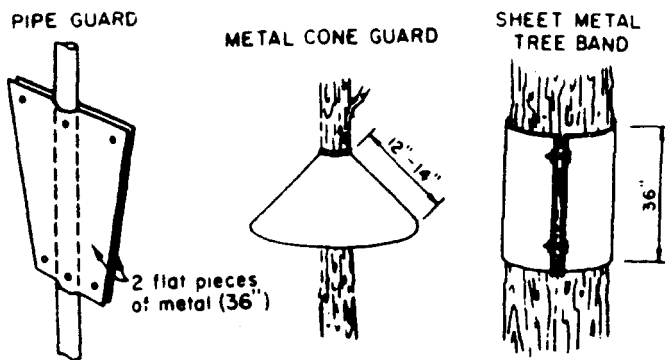


Figure 3. There are a number of ways to "predator proof" your homemade nest boxes. Above are examples of three of the more successful techniques.

Maintenance

Flicker nest boxes should be built so they can be opened for inspection or cleaning. It is important that the top piece be the component that opens in order that the interior can be packed full of sawdust. Each year the interior of the box should be cleaned out

and filled with fresh sawdust before the flickers return in early April. When sawdust is used, the box is not likely to be taken over by sparrows, starlings or other birds and animals before the flickers arrive.

Conclusion

The northern flicker is one of our most interesting songbirds. It is admired by old and young alike, and activities to help it can be very rewarding for individuals as well as organizations such as 4-H clubs, garden clubs, bird clubs, Boy Scouts and Girl Scouts.

The one-board nest box has a simple design and is easy to build and if placed and maintained according to the instructions given can provide a safe nest site for northern flickers in your area. Don't be discouraged if your flicker nest boxes are not used the first year. It often takes time before flickers become established nesters in a locality. But, once they start using your homemade nest sites, you are well on your way to enjoying these beautiful birds annually.

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WOOD- PECKERS

By Terry A. Messmer and Forrest B. Lee
Photos by Ed Bry and Irene Vandermolen

Woodpeckers are among the most interesting species of birds found in North Dakota. This publication contains information about the life history of three kinds of woodpeckers, the red-headed, hairy and downy, and how to help them by providing nesting boxes.

Life History

Red-headed Woodpecker

The plumage of the red-headed woodpecker is very distinctive. It has a red head and neck, a black back and white on the wings and underparts. It is a bird of the open country and can be seen along roadsides perched on poles, fence posts or trees. Like other woodpeckers it sometimes makes a drumming or pounding sound by striking a pole, roof, tree trunk or other object with its bill. Its call is a noisy "Tchur, Tchur."

Red-headed woodpeckers nest from southern British Columbia east through southern Canada to southeastern Ontario and south to the Gulf Coast and southern Florida. Most red-headed woodpeckers spend the winter in the southern part of this area.

As a summer resident in North Dakota, red-headed woodpeckers nest throughout the state. They are found in a variety of habitats including open forests, shelterbelts, woodlots, urban parks and streets, roadsides and fence rows. These birds have a slow

undulating flight and occasionally they are struck by cars as they fly across highways.

Red-headed woodpeckers nest in tree cavities, telephone poles, or fence posts. Cavities may be anywhere from 10 to 50 feet above the ground and have an entrance hole that is about 2 inches in diameter.

In North Dakota red-headed woodpeckers nest from June to July. Nests usually contains from four to six eggs. The incubation period is about 14 days and the male often assists with incubation. The young tend to follow the parents for some time after leaving the nest.

Insects such as beetles, borers, ants, wasps, bees and grasshoppers make up a substantial part of the diet of red-headed woodpeckers. They also eat grains, small fruits, berries and nuts such as acorns. Sometimes these birds store berries and nuts in cracks and crevices of trees, posts or poles.

Red-headed woodpeckers have a unique habit of catching insects in flight. They will watch for insects while perched on a tree or pole. When an insect is spotted, they will fly out to capture it in air and then return to the perch.

Hairy Woodpecker

The hairy woodpecker is a medium-sized black and white bird about nine inches long. The male hairy woodpecker has a scarlet patch on the back of the head. The hairy woodpecker has a large bill compared with the short and more delicate appearing bill of the downy. The cry of the hairy woodpecker is a sharp "chink." It frequently makes a tapping or drumming sound by striking dead trees or other objects with its bill.

In North America hairy woodpeckers are found over a wide area extending from Canada to Central America. In North Dakota it is a common resident in parts of the state with coniferous or deciduous trees, including riparian habitats, shelterbelts, farmsteads and trees in cities and towns. This woodpecker is largely nonmigratory and may be seen in all seasons.

The nest is in a cavity in a tree. Usually a new nest is made each season, but some cavities are occupied more than one year. There seems to be some preference for deciduous trees such as aspen, ash, elm or cottonwood. Both dead and live trees are used. However, when a live tree is used it is often one with a dead center. The entrance to the cavity usually is from 5 to 30 feet above the ground. The size of the entrance hole measures about 2 inches \times 2½ inches; the longer dimension being vertical. Nesting material is not carried into the cavity, but eggs are laid on a bed of wood chips that may be contained within the cavity.

In North Dakota hairy woodpeckers nest from late April to mid-July. From three to six white eggs are laid and incubated for 11 or 12 days. Only one brood is reared each year. The young are able to fly when 20 to 30 days of age, and they leave the nest soon after.

The hairy woodpecker does much of its feeding in dead trees. Tree boring insects are its main food. The tip of its tongue is equipped with a rigid barbed spear and is extended into the hole of a wood boring insect, and the insect is speared and pulled out by retraction of the tongue.

Downy Woodpecker

The downy woodpecker is a small black and white bird about six inches long. The male downy woodpecker, like the hairy, has a scarlet patch on the back of the head. The voice of this woodpecker sounds something like "chick" and is made as it moves about trees and shrubs in search of food. In late winter the male may make a drumming sound at dawn by striking a dead tree trunk or branch with its bill.

This woodpecker is found throughout North America north of the Mexican border.

In North Dakota it is a common resident in parts of the state where trees are found. It nests in woodlands, windbreaks, shelterbelts and urban deciduous forests

throughout the state. It is a nonmigratory species which spends the entire year in the area in which it breeds. It is not as partial to heavy timber as the hairy and may be seen in orchards, woodlots, city parks, and wooded streets.

The nest is in a tree cavity, usually in dead or dying wood. Dead stumps of aspen, ash, elm, cottonwood or willow are favored sites. The entrance to the cavity may be from 5 to 50 feet above the ground. The entrance hole is round and the diameter is from 1¼ inches to 2 inches and is usually found on the underside of a branch. Nest cavities are usually from 8 to 18 inches deep and contain a few wood chips in the bottom of the cavity.

In North Dakota, downys nest from mid-May to mid-July. From three to six glossy white eggs are laid and then incubated for about 12 days. The male assists with incubation. Only one brood is reared each year. The young are able to fly at about 26 to 28 days of age at which time they leave the nest.

Insects make up a large proportion of its diet. These include larvae and beetles injurious to trees as well as ants, plant lice and scale insects. It has a specialized tongue which is long and worm-like with a pointed tip which enables it to extract wood-boring beetles and their larvae from within a tree trunk. Its diet also includes a smaller amount of wild fruit and seeds. It forages in shrubs and herbaceous plants as well as in trees. In winter, downy woodpeckers sometimes dig into the galls of goldenrods, wild sunflowers and other plants for larvae and maggots.

General Considerations for Building Woodpecker Nest Boxes

Red-headed and Hairy Woodpeckers

Red-headed and hairy woodpeckers will accept almost any kind of a nest box that they can enter, and plans are available for a number of types. Several factors should be considered when deciding on what kind of a nest box to buy or build. These include the size of entrance hole and interior, adequate ventilation and drainage, and the ability to open the house for examination and cleaning.

The inside floor dimensions should not be smaller than 6×6 inches or an equivalent number of square inches if the floor is not square. The inside depth from bottom to top should be from 12 to 16 inches and the inside distance from the floor to the bottom of the entrance hole should be from 9 to 12 inches. Two or more ¼-inch ventilation holes should be drilled near the top of the front or side boards and the inside the bottom board should have three or four ¼-inch or ⅜-inch drainage holes. The inside of the front board should be roughened for 3 inches below the entrance hole to provide footing for the young birds as they leave the nest. **No perch of any kind should be attached to the nest box.** Sparrows may be attracted by the perch and it is not needed by the woodpeckers. These woodpeckers are

fully satisfied with nest boxes of simplest design, as long as these basic requirements are followed closely.

Nest boxes should be made of wood. Almost any kind of wood will do, such as that from old crates or boxes and scrap lumber which often is available at little or no cost from lumber yards or building contractors. Pine lumber and exterior grade plywood of $\frac{3}{4}$ -inch thickness are both excellent. (The actual thickness of 1-inch standard dimension lumber is about $\frac{3}{4}$ inch.)

While various kinds of nest boxes give satisfactory results, we recommend one of simple design that is easy to construct. It is the "one-board" nest box which can be made from a single 8-foot piece of 1-inch by 10-inch lumber (Figure 1).

Downy Woodpeckers

The considerations previously expressed for the red-headed and hairy woodpecker generally hold true for the downy woodpecker except for the following exceptions.

The recommended inside floor dimensions are from 4×4 inches to 5×5 inches, or the equivalent number of square inches. The inside depth from bottom to top should be from 8 to 10 inches. The distance from the floor to the bottom of the entrance hole should be from five to seven inches on the inside. The entrance may be a round hole $1\frac{1}{4}$ to 2 inches in diameter.

We recommend a nest box of simple design that is easy to construct. It is the "one-board" nest box which can be made from a single 4 foot piece of 1-inch by 6-inch lumber (Figure 2).

Materials Needed

Red-headed and Hairy Woodpecker Nest Box

- Lumber - A single piece of 1-inch by 10-inch by 8-foot standard dimension lumber. (The actual width of a 10-inch board is $9\frac{1}{4}$ inches.)
- Nails - About 16 7d galvanized box nails.
- Hinges - Two hinges to hold top in place and allow it to be opened (use of cleat instead of hinges is optional).
- Sawdust - Amount needed to provide a depth of three inches in the bottom of the nest box.

Downy Woodpecker Nest Box

- Lumber - A single piece of 5-inch by 6-inch by 4-foot standard dimension lumber. (The actual width of a 6-inch board is $5\frac{1}{2}$ inches.)
- Nails - About 18 7d galvanized nails.
- Sawdust - Amount needed to provide a depth of 1-inch in the bottom of the nest box.

Construction

Red-headed and Hairy Woodpecker Nest Box

First measure and cut pieces to proper length as follows from the 8-foot piece of lumber (Figure 1):

- Front**-1 piece $9\frac{1}{4}$ inches by 16 inches
- Back**-1 piece $9\frac{1}{4}$ inches by 22 inches
- Sides**-2 pieces $9\frac{1}{4}$ inches by 16 inches with two $\frac{1}{4}$ -inch ventilation holes in each near the top.
- Floor**-1 piece $9\frac{1}{4}$ inches by $7\frac{3}{4}$ inches with four $\frac{1}{4}$ -inch drainage holes as shown.
- Roof**-1 piece $9\frac{1}{4}$ inches by 12 inches.

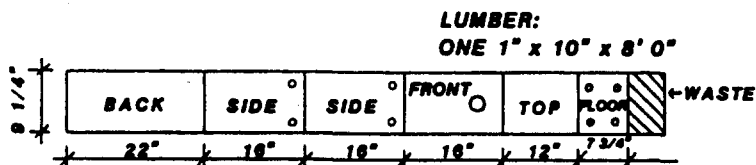
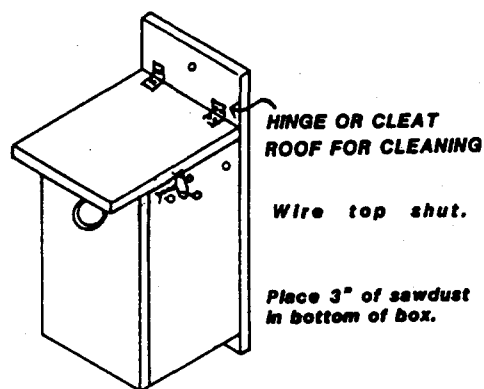
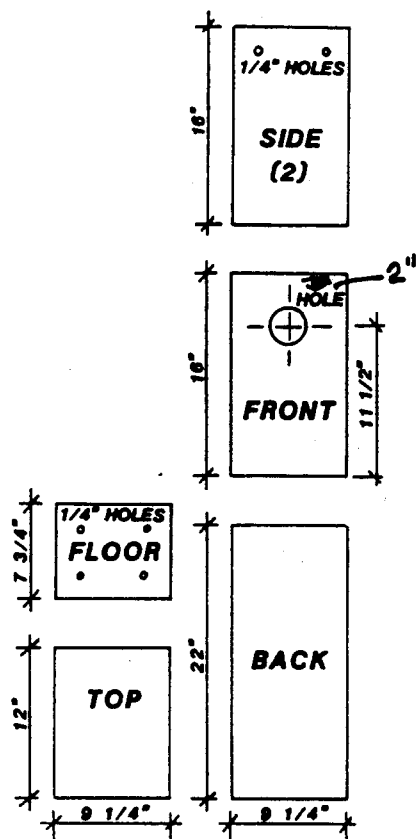


Figure 1. One-board Red-Headed and Hairy Woodpecker Nest Box.

Next, drill a 2-inch diameter entrance hole in front piece. Center the entrance hole $4\frac{1}{2}$ inches below top and $11\frac{1}{2}$ inches above bottom of front piece. Now, assemble and nail solidly in place all components except the top piece. Fit top piece in place and attach with hinges or cleat. The top of box should be 4 inches below top of back piece.

Two nails are driven as shown in Figure 1 for wiring the top of the box in a closed position. When box is completed, put about 3 inches of sawdust in bottom of nest box.

Downy Woodpecker Nest Box

Measure and cut pieces to proper length as follows (Figure 2):

Front—One piece $5\frac{1}{2}$ inches by 8 inches

Back—One piece $5\frac{1}{2}$ inches by 11 inches

Sides—Two pieces $5\frac{1}{2}$ inches by 8 inches with two $\frac{1}{4}$ -inch ventilation holes in each near the top.

Floor—One piece 4 inches by $5\frac{1}{2}$ inches with four $\frac{1}{4}$ -inch drainage holes as shown.

Roof—One piece $5\frac{1}{2}$ inches by $8\frac{1}{4}$ inches.

Next drill the $\frac{1}{4}$ -inch diameter entrance hole in front piece. The top of the entrance hole is 1 inch below top of front piece. The $\frac{1}{4}$ -inch holes allows use by chickadees, wrens and nuthatches but not house sparrows and starling.

Now assemble and nail solidly all components in place except for one side. The floor piece should be recessed $\frac{1}{4}$ inch above the level of the bottom.

Then fit remaining side piece in place and drive two pivot nails, one through back piece and one through front piece about 2 inches from top. These allow the side to swing open for cleaning.

Last, drill one hole on this side near lower edge of front piece and insert nail in hole and drive into side piece. This nail is pulled out in order to lift side piece to inspect or

clean the cavity. A second nail may be used on the back side so that if one nail would come out of place, the side would still be held in place.

After the box is completed, put down about an inch of sawdust in the bottom of the nest box.

Mounting the Nest Box

Red-headed, Hairy and Downy Woodpecker Nest Box

Red-headed, hairy and downy woodpecker nest boxes can be mounted in several ways. They may be attached to existing wood or metal fence posts, power or telephone poles, or on wood or metal posts, or pieces of pipe designed specifically for this purpose.

The one-board nest box has both upper and lower extensions, and both extensions can be attached to the intended support. This nest box can also be mounted on top of a wooden fence post. Another way to mount it is to place the back of the nest box against the intended support and attach the bottom extension using lag bolts. If this is done, washers should be used with the lag bolts to give the nest box added stability.

If the support is a metal post or pipe, the nest can be attached in place by threading wires through holes in the upper and lower extensions and tightening the wires so there is a firm fit. Another way is to use U-bolts which fit around the steel post and pipe, with the threaded ends extending through holes in the extensions. In this case, washers are used and the nuts are tightened so the nest box is held firmly in place.

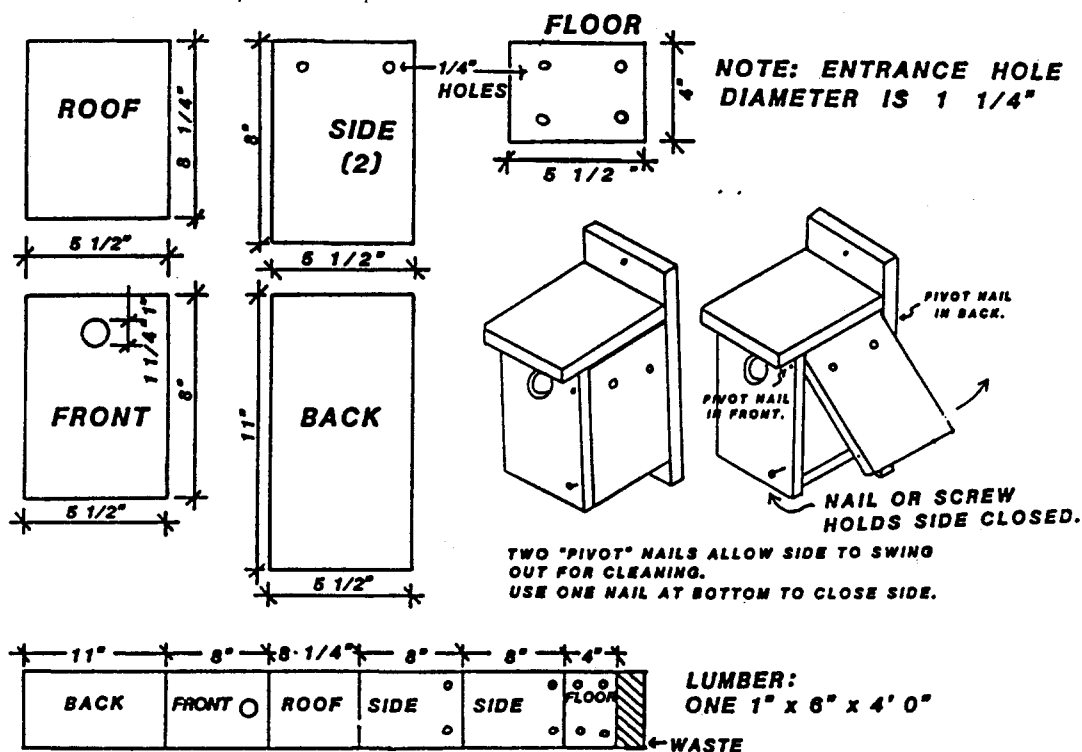


Figure 2. One-board Downy Woodpecker Nest Box.

Nest boxes are sometimes mounted on top of a length of pipe, one end of which is driven into the ground far enough so the pipe is rigid. In this case a threaded pipe flange is attached to the bottom of the nest box, using bolts or screws. The end of the piece of pipe which extends above the ground is threaded, and the nest box and support pipe are engaged by simply screwing the end of the pipe into the pipe flange applying enough pressure so it will not work loose (Figure 3). Galvanized $\frac{1}{2}$ -inch or $\frac{3}{4}$ -inch pipe provides excellent support, and pipe flanges for pipes of these sizes are readily available at most hardware stores.

Both the upper and lower extensions of the nest box can be omitted if pipe flange mounting will be used. Grease spread on the support pipe will keep cats, raccoons, squirrels and other animals from climbing up to the nest box.

The nest boxes may also be attached to the trunks of trees but, this method is generally considered the least desirable because of the greater danger to the nesting birds from tree-climbing animals like raccoons and cats. Squirrels also will sometimes enlarge the entrance holes and use the nest box for their home.

Electric or telephone poles when located in the right places are often suitable for mounting the nest boxes. However, permission should be obtained from the utility company before this is done. If the utility company objects to nails and screws, the houses can be wired securely to the poles.

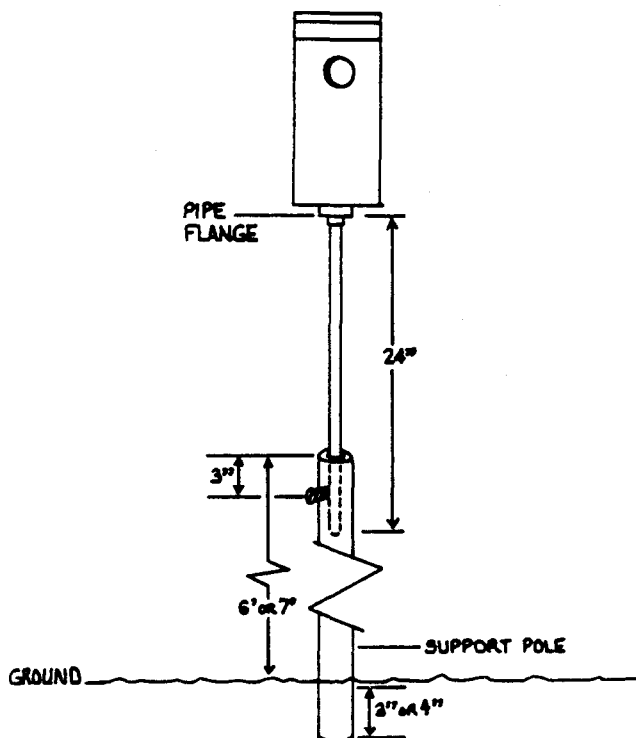


Figure 3. Nest boxes can be mounted on pipe flange assemblies. This allows for quick and easy removal for winter storage in addition to the ability to readily raise or lower nest box height.

Sheet metal collars 18 inches or more in height can be wrapped around wooden poles or posts or even dead trees to keep tree-climbing animals from getting to the bird houses. Suitable metal sheets can be obtained at little or no cost from a newsprint office. Figure 4 demonstrates additional methods to predator proofing your nest box.

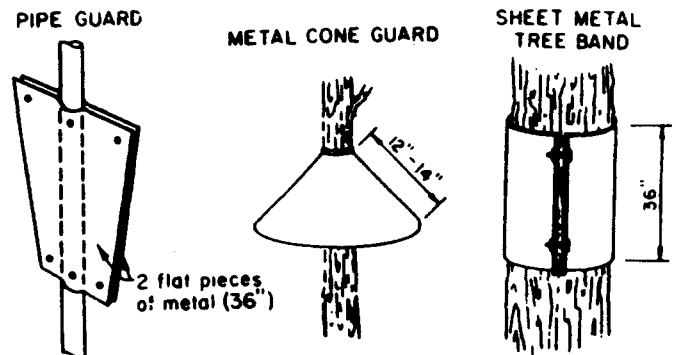


Figure 4. There are a number of ways to "predator proof" your homemade nest boxes. Above are examples of three of the more successful techniques.

Placement

Red-headed Woodpecker Nest Box

Red-headed woodpecker nest boxes are best placed in fairly open situations. Satisfactory locations include shelterbelts, scattered clumps of trees, cemeteries, golf courses, farmsteads, and urban and suburban neighborhoods. Fence posts, telephone or power poles, and dead snags are often good places to install nest boxes for red-headed woodpeckers. However, avoid putting them close to well-traveled highways. Their slow undulating flight makes them especially vulnerable to being struck by cars as they fly across highways.

It is recommended that the height of the nest box be from 10 to 20 feet above the ground, this distance being from the ground to the bottom of the nest box. Ten feet is a good height for ease of mounting and maintenance. In pastures the nest boxes should be placed high enough so that livestock cannot rub on them. If possible, the entrance should face an open area, preferably in a direction away from prevailing winds and rains. The nest box should be in place before the first of April.

Hairy Woodpecker Nest Boxes

Hairy woodpecker nest boxes are best placed in wooded situations with clearings, or at the edge of woods where there are scattered clumps of trees or shrubs. Satisfactory locations include hardwoods along rivers, shelterbelts, farm groves, and wooded urban and suburban neighborhoods.

It is recommended that the height of the nest box be from 10 to 20 feet above the ground, this distance being from the ground to the bottom of the nest box. Ten feet is a good height for ease of mounting and

servicing later on. In pastures, the nest boxes should be placed high enough so that livestock cannot rub on them. If possible, the entrance should face an open area, preferably in a direction away from prevailing winds and rains. The nest box should be in place before the first of April.

Downy Woodpecker Nest Boxes

Downy woodpecker houses are best placed in wooded situations near or at clearings or the edge of groves or woods. Satisfactory locations include pastures, shelterbelts, farm groves, country cemeteries, golf courses and wooded urban or suburban neighborhoods. Avoid placing the houses near buildings and feedlots that attract house sparrows and starlings.

It is recommended that the height of a downy woodpecker house be from 5 to 15 feet above the ground or water, this distance being to the bottom of the house. A good rule of thumb is to place the houses chest-high for this enables easy access for inspection and cleaning. In pastures, houses should be placed high enough so that livestock cannot disturb them. The entrance should face an open area, preferably in a direction away from prevailing winds and rains. When utility poles are used as the support, the house can be attached on the east or northeast side of the pole to provide some protection from the hot afternoon sun.

In North Dakota, the houses should be in place before the first of April.

Maintenance

Painting or staining will improve the appearance and life of the nest box even though this is not necessary. If you choose to paint or stain, use only light colors such as light brown, tan, gray or green. Dark colors may cause the interior of the nest box to get too warm on hot sunny days. Raw linseed oil helps protect the wood and results in a natural finish. The inside of the nest box and inside rim of the entrance hole should not be painted or stained. **Do not use chemical wood preservatives.**

It is important that the nest boxes be built so they can be opened for inspection or cleaning. The one-board nest boxes have this feature. It is recommended that the nest be removed and the nesting material be brushed out after the young have left the nest. Make sure the interior of the nest box is free of nest material or other debris in late March or early April, prior to the nesting season. Squirrels or mice may use the nest boxes in winter. To prevent this, the nest box door can be left open during winter but if this is done be sure to close it before the nesting season. The life of a nest box can be enhanced if you remove and store the house rather than leaving it exposed to winter weather.



Conclusion

Woodpeckers are one of our favorite birds and activities to help them can be very rewarding for individuals as well as organizations such as bird clubs, 4-H clubs and scouts.

The one-board nest box has a simple design and is easy to build and if placed and maintained according to the instructions given, can provide a safe nest site for woodpeckers in your areas. Don't be discouraged if your homemade nest box isn't used the first year. It often takes time before these birds become established nesters in a locality. But, once they start using your homemade nest sites, you are well on your way to enjoying these beautiful birds annually.

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PURPLE MARTIN

By Terry A. Messmer and Forrest B. Lee

Life History

The purple martin is the largest swallow nesting in North Dakota. The male is a glossy bluish-black. The female is less bluish-black on the upper parts and the underside is light gray or whitish. The martin is a cavity nester and typically nests in colonies. Many pairs will nest in a single nesting house containing many compartments. The song is very musical. Near the nesting colony, the songs may blend into somewhat of a soft chorus.

In North America purple martins nest throughout a wide area extending from the southern provinces of Canada south to Florida, the Gulf Coast and central Mexico. It spends the winter in the Gulf states and in South America (Brazil).

In North Dakota the martin is common in the Turtle Mountains and east of the Missouri River. They are found in cities, towns and rural habitats wherever there are suitable nesting cavities or nesting houses provided for them. They prefer a site that is near water and that has overhead perches such as power lines nearby. They sometimes nest under bridges or in holes in trees.

The purple martin seems to prefer living near people rather than in more natural sites such as hollow trees and rocky cliffs. This is probably due to the scarcity of suitable natural sites to nest in.

Purple martins return to North Dakota in early April. Usually the first to appear are the male scouts. The females will begin arriving a few days to 1½ weeks later. They leave almost as quickly as they

show up and by late August most have begun to return to their traditional wintering areas.

Once they have arrived, nesting activity begins immediately. The nest cavity is filled with leaves, grasses, weed stems and other vegetation and is lined with finer materials, sometimes including feathers or pieces of rag. The nest contains from four to six white eggs. The incubation period is 15 to 16 days. The female does all the incubation but the male assists with feeding the young.

The food of purple martins is largely flying insects such as mosquitoes, bees, moths, wasps, and flies, which are captured in flight.

Purple Martin House

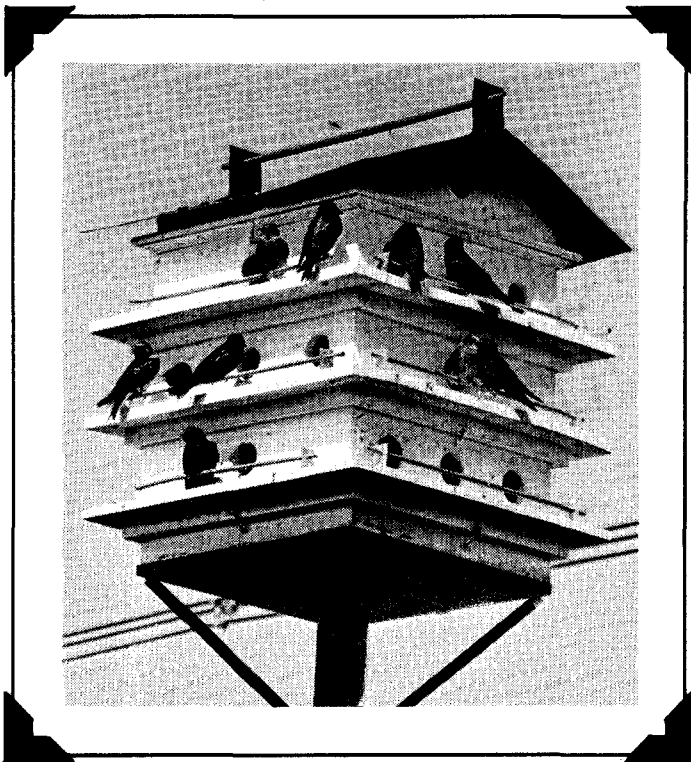
The purple martin is a favorite of city people because it is readily attracted to homemade martin houses and thus persuaded to nest in anyone's backyard.

Following are plans and instructions for building and erecting nest boxes for purple martins.

Materials Needed

Plywood

- 1 - sheet 4-feet×8-feet exterior grade ¼-inch thick
- 1 - sheet 2-feet×4-feet exterior grade ¼-inch thick



Two-Story Martin House

Wood

- 1 - piece 2-inch×2-inch×6-inch for chimney
- 1 - piece 1-inch×2-inch×14-inch pine
- 1 - piece 1-inch×1-inch×8-foot pine
- 8 - 3-foot lengths of ¼-inch doweling

Screen

- 1 - piece 4-inch×8-inch aluminum window screen

Accessories

- 1 - pound of 2-inch or 2¼-inch galvanized siding nails
- Staples
- 1 - ¼-inch×24-inch or 30-inch thread rod with two nuts and two washers
- 4 - 4-inch×5-inch shelf brackets
- 1 - pound of ¼-inch or ⅜-inch round head stove bolts
- 1 - pound of 1-inch #8 flat head wood screws
- 1 - quart of white paint
- 1 - tube waterproof wood glue
- 1 - post (4-inch×4-inch) or pole 16 to 20 feet long, wood or metal

Construction

Layout, label, drill the 2¼-inch entry holes and cut all pieces on the plywood sheets as indicated in Figure 1. Next, using the one 8-foot length of the 1-inch×1-inch pine, cut eight pieces 5⅞ inches long to be used as corner blocks and 16 2-inch pieces to be used to position the walls of the house (Figure 1).

Now cut out and assemble the house base from the 14-foot length of 1-inch×2-inch pine, using the 2-inch or 2¼-inch galvanized siding nails. Then attach this base to the previously cut plywood piece label "Pc 1," using the 1-inch galvanized wire nails and wood glue.

Start assembling the sidewalls for the first story using labeled pieces 2a, 2b, 3a, and 3b and labeled pieces 6a, 6b, 7a and 7b for the second story. Fasten the pieces together using glue and the 1-inch galvanized wire nails. (Use three nails at each end of each piece).

Now position the first story sidewalls on the base piece. Mark the position for each 1-inch×1-inch×2-inch block to hold sidewall in position. Attach the blocks to base with glue and two 1-inch nails. Place sidewall in position on the base and insert the partitions. Position the plywood piece labeled "Pc 5" and mark for the location of 1-inch×1-inch×2-inch blocks near corners on the underside. Attach the blocks using glue and one inch nails.

Next, place this piece in position. Now, position the second-story sidewall on this piece and mark for the location of the 1-inch×1-inch×2-inch blocks. Move them to the opposite side of the corner from the blocks underneath for convenience in attachment to this piece. Attach blocks using glue and one-inch nails, position sidewalls and insert the partitions.

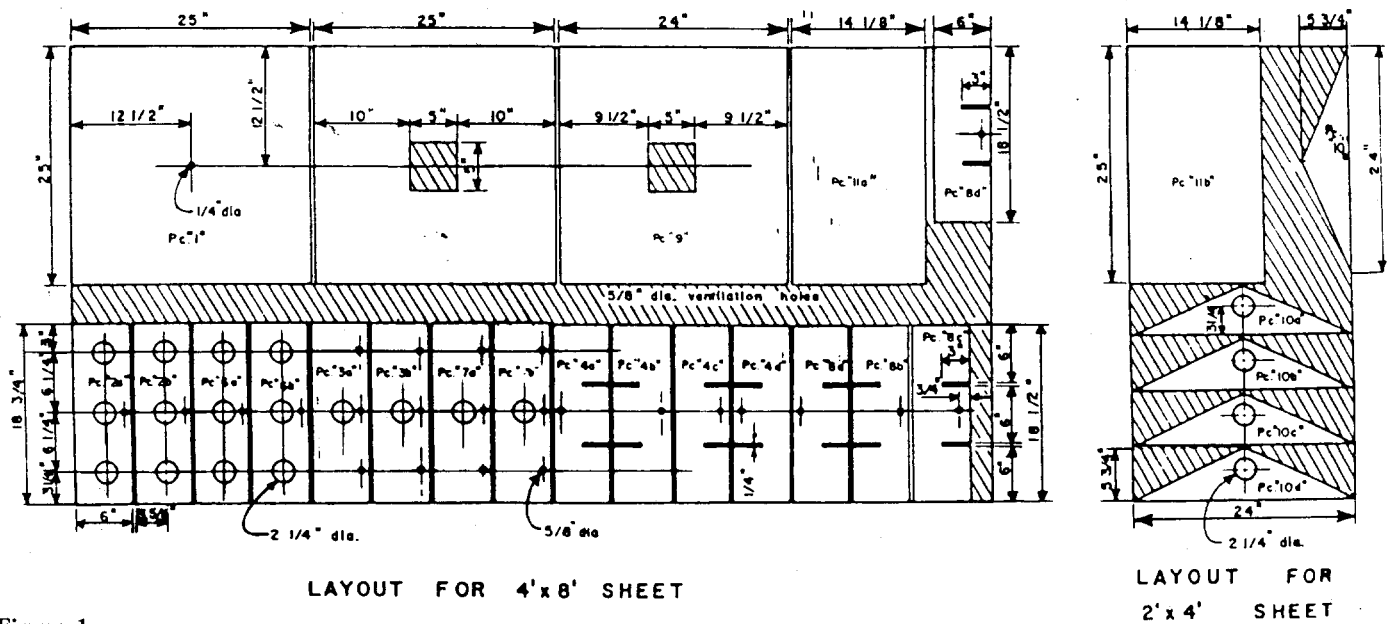
Now position the plywood piece labeled "Pc 9." Mark location for 1-inch×1-inch×2-inch positioning blocks on underside and attach the blocks.

Glue the pieces labeled 10a and 10b, and 10c and 10d together to form gable ends ½-inch thick. Staple the screen over the center openings. Glue scrap pieces to piece labeled 10e to make it ½ inch thick. This piece will be positioned adjacent to the center threaded rod going up through the exact center of the house. Now, attach these gable ends and center support piece with glue and nails to "Pc 9" from the underside. Then attach the roof pieces (11a and 11b) to the gable ends with glue and nails.

The unit is held together by a thread rod extending from underside of 1-inch×2-inch base frame through the center of the chimney. Make chimney from a piece of 2-inch×2-inch wood. Cut V-notch on end to fit roof. Have it extend 2½ inches above roof peak. Drill ¼-inch hole in chimney and roof for rod. Nail the chimney in place and insert the rod and tighten up. Now put ¼-inch dowel railings around each ledge.

Last, paint the house white and drill ½-inch air-vent holes between compartments. Prior to fastening the house to the top of a wooden pole, drill a hole in top of pole to accommodate nut on lower end of threaded rod. When mounting the house, use four 4-inch×5-inch shelf brackets with ¼-inch or ⅜-inch×1½-inch round head stove bolts and 1-inch #8 flat head wood screws to attach to pole.

Note that additional stories may be added to your new martin "high rise." Initially it is recommended to start with only one or two layers then add others as your colony grows. Generally, however, it is best not to put more than 24 nesting compartments in a single apartment house (Figure 2).



Mounting the Nest Box

Martin houses should be mounted on a pole 16 to 20 feet long. Make the pole adjustable so that the house can be lowered to the ground. This movability is essential for proper maintenance of the house.

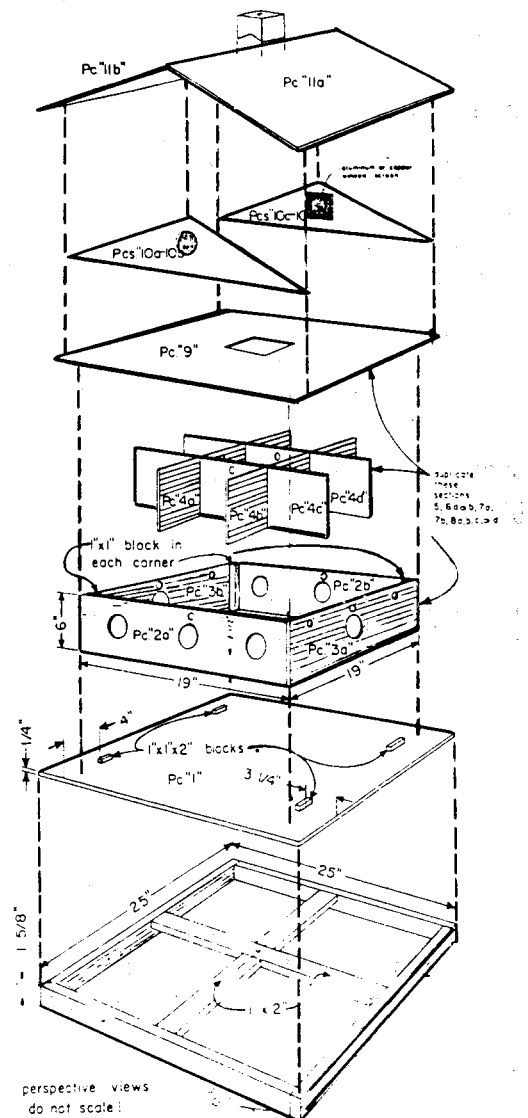
Before you put up the house, make sure you put wooden dowel railings around each ledge. Young birds have a tendency to perch on ledges to escape the heat of the house. If they happen to fall from the house, death will soon follow. Parents will not rescue or feed their young on the ground. The quarter-inch dowel railings around each ledge will prevent this from happening.

Placement

In historic times, martins nested in cavities of trees, holes in cliffs, in caves and other natural sites. Presently they nest almost entirely in artificial nesting boxes placed in house yards in cities, towns and rural areas.

Purple martins are powerful fliers which circle overhead, alternating rapid wing beats with periods of sailing as they capture insects in the air. It is said that one purple martin can consume over a thousand mosquitoes a day.

A martin house should be erected in an open area at least 25 feet from the nearest tree or building. Martins need plenty of room for their aerobatic entrances and departures. Clear access on all sides tells martins that natural predators such as cats aren't waiting in ambush.



Maintenance

It is important that the pole assembly be adjustable so that the house can be easily lowered to the ground. This makes it possible to remove the house from the support pole and store it indoors during winter. This extends the life of the house and enable you to clean it out before it is put back up in the spring.

If the house is left up all winter, you can prevent sparrows and starlings from occupying the house by plugging the entry holes. Then in early April just before the martins return, the entry holes can be unplugged and the house cleaned of all nesting debris using a wire hook. The house should be cleaned weekly thereafter until the martins arrive.

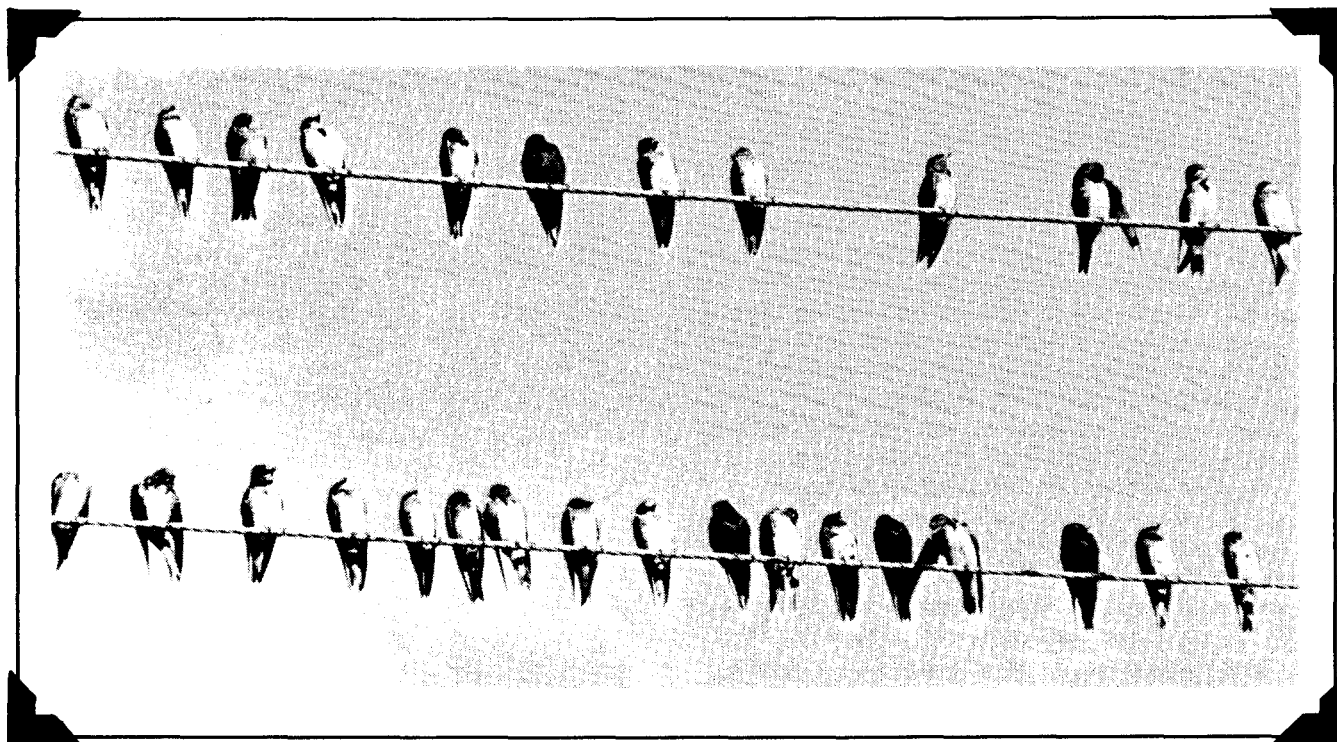
While the martin house need not be painted, it is recommended that it be painted white. White reflects the sun's rays helping keep the house cooler. The 1/2-inch air-vent holes drilled between the compartments also help keep the house cooler. Again, also remember that the 1/4-inch dowel railings around each ledge are important and should be kept in good repair.

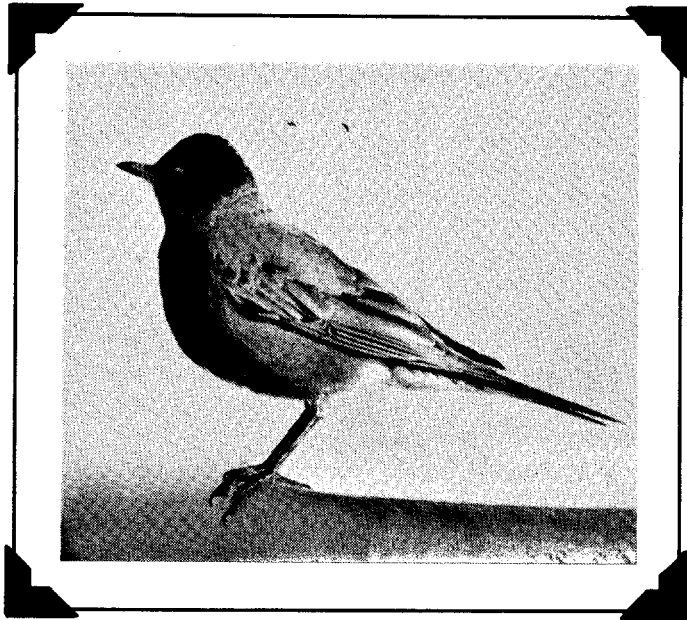
Conclusion

By the proper handling and placement of your homemade martin house you are well on your way to establishing a new colony of purple martins in your area. Don't get discouraged if your house isn't used the first year. It may take a while for martin scouts to find your house, but once they have, martins will continue to come back each year as long as it is properly maintained. Once martins move in, you may see "your" birds for many years. A martin's life span averages nearly 14 years.

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AMERICAN ROBIN

By Terry A. Messmer and Forrest B. Lee

Life History

The robin needs little introduction. It is known to many both by its appearance and song. The adult male has a dark back and head and a reddish-brown underside. The female has similar coloration which is somewhat duller than that of the male. It is a fairly large bird that measures about 10 inches from the tip of the bill to the tip of the tail. It is a member of the thrush family, noted for having beautiful songs. The song of the robin has been described as cheery and hearty. Several may sing in chorus at daybreak.

The North American breeding range of the robin extends from the tree line of the North through much of the continent to the Gulf of Mexico. It spends the winter in the southern part of this range, or goes farther south into Mexico and Central America.

Robins arrive in North Dakota early in the spring and they do not leave until late in the fall. In some years, nesting may be commenced in late April.

The robin nests across the entire state. In rural areas it may be found in woods or shelterbelts located near openings such as clearings, fields or pastures. It gets along well with people and is found in residential areas such as cities, suburbs, towns, farmsteads and resorts.

The nests are often located at tree forks on horizontal branches or in shrubs or on ledges or shelves on buildings. The nest is made of mud which contains strands of grass or other plant material and is lined with fine grasses. The robin will readily accept artificial nest sites put out especially for them.

The clutch usually contains from three to six blue-green eggs. The incubation period is from 12 to 14 days. The female does all the incubating but the male

helps to feed the young. Sometimes robins raise two families of young in a year.

The food of robins is largely animal matter such as earthworms, grubs, beetles, grasshoppers and spiders. Wild fruits and berries are also eaten, especially in fall and winter.

Robin Nest Shelf

Robins will nest in a variety of situations which in many cases is some form of a shelf with open front and sides.

Following are plans and instructions for building and erecting one kind of artificial nest shelf for robins.

Materials Needed

- Wood - 1 - 30-inch piece of standard 1-inch×10-inch board. The actual width of a 10-inch board is 9¼ inches.
- 1 - 36-inch piece of 1-inch×2-inch board (pine, cedar or redwood)
- Nails - 20 1¾-inch to 2¼-inch galvanized nails
- 2 round head or lag screws to mount the nest shelf

Construction

First, cut the 1-inch×10-inch×30-inch board as follows (Figure 1):

- 1 - Top piece, 9¼ inches×8½ inches. Bevel top edge as shown in plan.
- 1 - Back piece, 9¼ inches×11½ inches. Bevel top edge as shown in plan.
- 1 - Bottom piece, 9¼ inches×6 inches. Drill ⅜-inch drain holes in each corner of bottom piece.

Next, cut the 1-inch×2-inch board as follows:

- 2 - Upright pieces, 1 inch×2 inches×9 inches. Bevel top ends as shown in plan.
- 2 - Side pieces for bottom, 1 inch×2 inches×5¼ inches.
- 1 - End piece for bottom, 1 inch×2 inches×9¼ inches.

Last, nail components together as shown in plan. Nail holes may be drilled to avoid cracking of wood.

Attaching the Shelf

Holes may be drilled in back piece and bottom extension for round head or lag screws for attaching shelf to building, tree or pole.

Placement

The nesting shelf is attached to a side of a building at least 6 to 12 feet above the ground. A preferred location is under the eaves of a barn, shed or house or in a tree. If possible, the shelf should face the south or east but this is not absolutely necessary.

The shelf can be placed on a wall by a window where the robin family can be easily seen. Or the shelf can be placed on the trunk of a tree where it can be viewed from a window.

Maintenance

Painting will improve the appearance and life of shelf but this is not necessary. Use only light colored paint or stain. A 1:1 mixture of raw linseed oil and turpentine helps protect the wood and results in a natural finish.

The robin's nest should be removed from the shelf after the young leave as robins build a new nest each year.

Conclusion

The robin is one of North Dakota's most enjoyable backyard bird species. It is a welcome sight in the spring, its song is beautiful, and it provides great enjoyment for people as it raises its young each summer. The robin nesting shelf has a simple design and is easy to build and put in place. Don't be discouraged if your shelves are not used the first year as it takes time for the robins to become established nesters in your yard.

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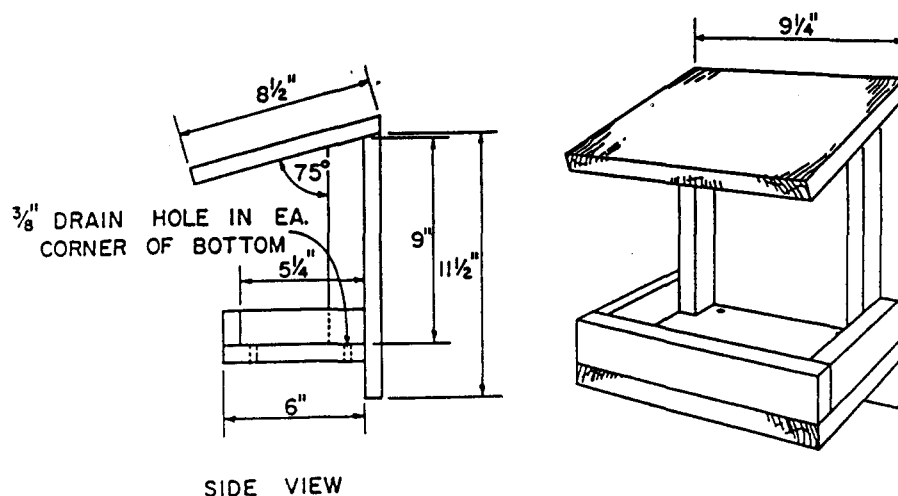
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Figure 1. Robin Nest Shelf.





TREE SWALLOW

By Terry A. Messmer and Forrest B. Lee

Life History

Tree swallows are closely associated with water. They are often found near wooded lakes, ponds or streams, where they may be seen circling over the water in pursuit of insects. Tree swallows are very sociable, for where one pair is found nesting there are usually several more in the neighborhood. There are exceptions to this rule, however, for single pairs sometimes use nest boxes far from water and other nesting tree swallows. This may occur when nest boxes intended for bluebirds are placed in pastures or other upland situations and are used by tree swallows.

Tree swallows have metallic blue or green upper parts and white underparts. During late July and early August they gather in large flocks and assemble on overhead wires or branches of dead trees. The voice of the tree swallow is said to be a soft warbling twitter.

Tree swallows range over much of North America and south to Central America. They spend the winter from the Gulf Coast south through Mexico to Honduras and Cuba. Tree swallows arrive in North Dakota early in the spring, often returning by late April. Nesting is from late May to late July. They are fairly common nesters in North Dakota occurring mostly east of the Souris and James Rivers.

The natural nest is in a cavity in a dead tree or in dead branches of a live tree. Tree swallows prefer nest sites over water, such as in standing dead trees in lakes or streams. The nest may be in an old woodpecker hole in a tree, fence post or telephone

pole. The entrance to the cavity is usually between 3 and 15 feet above the ground. The nest is lined with dry grass and feathers.

A clutch containing from four to six white eggs is laid and incubated for 13 to 16 days. After hatching the young leave the nest at about 16 to 24 days of age. Tree swallows sometimes raise two broods in a season.

The tree swallow feeds mostly on insects, flies being a favorite. It eats bees, moths and other flying insects which it captures in the air as it circles over land and water. It also consumes some berries and seeds.

Tree swallows readily accept nest boxes and sometimes will nest in bluebird nest boxes. Following are general considerations, plans, specifications and placement instructions for a nest box for tree swallows.

One-Board Tree Swallow Nest Box

Tree swallows will accept almost any kind of a nest box that they can enter, and plans are available for a number of types. Several factors should be considered when deciding on what kind of nest box to buy or build. These include: size of entrance hole and interior, adequate ventilation and drainage, and the ability to open the house for examination and cleaning. The recommended inside floor dimensions are from 4×4 inches to 5×5 inches, preferably the latter. The inside depth from bottom to top should be from 6 to 10 inches. The distance from the floor to

the bottom of the entrance hole should be from 4 to 6 inches on the inside. Two or more 1/4-inch ventilation holes should be drilled near the top of the front or side boards. The bottom board should have three or four 1/4-inch or 3/16-inch drainage holes. The inside of the front board should be roughened for three inches below the entrance hole to provide footing for the young birds at the time they leave the nest. No perch of any kind should be attached to the nest box. Sparrows may be attracted by the perch and it is not needed by the tree swallows.

Tree swallows are fully satisfied with nest boxes of simplest design, as long as these basic requirements are followed closely. Tree swallow nest boxes should be made of wood. Almost any kind of wood will do, such as that from old crates or boxes and scrap lumber which often is available at little or no cost from lumber yards or building contractors. Pine lumber and exterior grade plywood of 3/4-inch thickness are both excellent. The actual thickness of 1-inch standard dimension lumber is about 3/4-inch.

The entrance may be a round hole 1 1/2 inches in diameter or an oval opening 1 3/8 inches wide and 2 1/4 inches high. The oval opening seems to be preferred by tree swallows, and it is small enough so starlings cannot easily enter the nest box.

While various kinds of tree swallow nest boxes give satisfactory results, one of simple design that is easy to construct is the "one-board" nest box which can be made from a single 6-foot piece of 1-inch by 6-inch lumber. Following are instructions for building one of these nest boxes.

Materials Needed

1. A single piece of 1-inch by 6-inch by 6-feet standard dimension lumber. The actual width of a 6-inch board is 5 1/2 inches.
2. About 18 galvanized box nails.

Construction

Measure and cut pieces to proper length as follows (Figure 1):

Front – One piece 5 1/2 inches by 9 inches.

Back – One piece 5 1/2 inches by 13 1/2 inches.

Sides – Two pieces 5 1/2 inches by 9 inches with two 1/4-inch ventilation holes in each near the top.

Floor – One piece 4 inches by 5 1/2 inches with four 1/4-inch drainage holes as shown.

Roof – One piece 5 1/2 inches by 7 1/2 inches.

Next drill the entrance hole in front piece, 1 3/8 inches wide by 2 1/4 inches high. The top of the entrance hole is 3/4 inch below top of front piece.

Now assemble and nail solidly all components in place except for one side. The floor piece should be recessed 1/4 inch above the level of the bottom.

Then fit remaining side piece in place and drive two pivot nails, one through back piece and one through

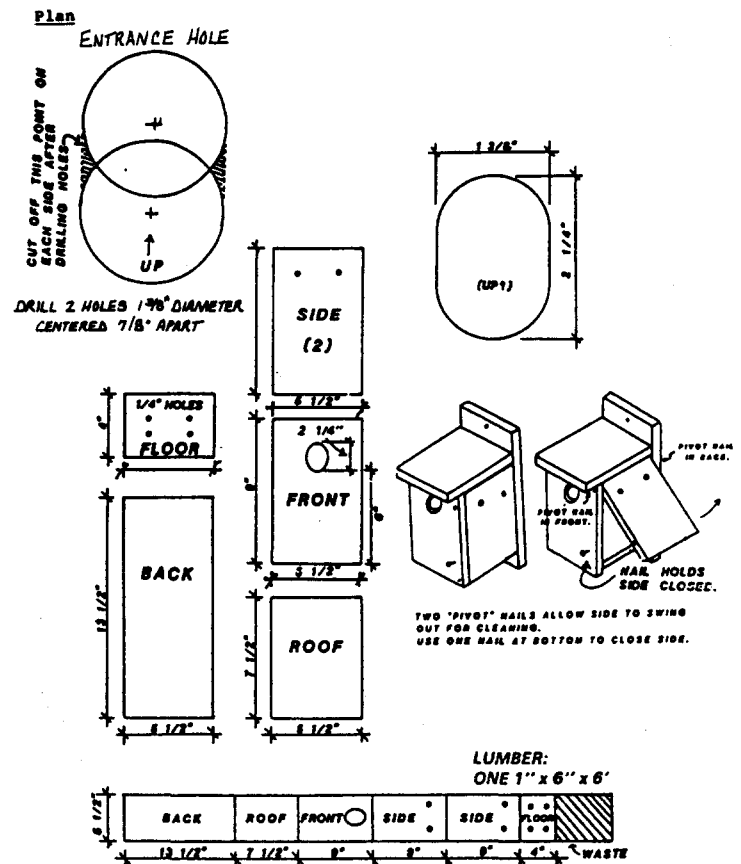


Figure 1. One-Board Tree Swallow Nest Box

front piece about 2 inches from top. These allow the side to swing open for cleaning.

Lastly, drill one hole on this side near lower edge of front piece and insert nail in hole and drive into side piece. This nail is pulled out in order to lift side piece to inspect or clean the cavity. A second nail may be used on the back side so that if one nail would come out of place the side would still be held in place.

Attaching or Mounting the Nest Box

Tree swallow nest boxes can be mounted in several ways depending on the type of nest box and what kind of supports are available. They may be attached to existing wood or metal fence posts, power or telephone poles, or on wood or metal posts or pieces of pipe driven in place especially for this purpose.

The one-board house is attached to a wood support with either nails or lag screws and washers through the upper and lower extensions.

Small holes drilled through the extensions make it easier to start the nails or lag screws without cracking the board. The house is held in the desired position while a hammer or wrench is used to anchor it firmly in place.

The one-board nest box can be attached to a metal post or pipe by threading wires through holes in the upper and lower extensions and tightening the wires so there is a firm fit. Another way is to use U-bolts

which fit around the steel post or pipe, with threaded ends through holes in the extensions. Washers are used, and the nuts are tightened so the house is held firmly in place.

Tree swallow nest boxes are sometimes mounted on top of a length of pipe one end of which is driven into the ground far enough so the pipe is rigid. In this case a threaded pipe flange is attached to the bottom piece with bolts or screws (Figure 2). The end of the piece of pipe which extends above the ground is threaded, and the tree swallow nest and support pipe are engaged by simply screwing the end of the pipe into the pipe flange, applying enough pressure so it will not work loose.

Galvanized $\frac{1}{2}$ -inch or $\frac{3}{4}$ -inch water pipes provide excellent support, and pipe flanges for pipes of these sizes are readily available at hardware stores.

Both the upper and lower extensions can be omitted when it is planned that a pipe flange will be used. Grease spread on the support pipe will keep cats, raccoons, squirrels and other animals from climbing up to the house.

Tree swallow nest boxes may also be attached to the trunks of trees, but except for dead trees standing in water, this method is generally considered the least desirable. This is because of the greater danger to the nesting birds from tree-climbing animals like raccoons and cats.

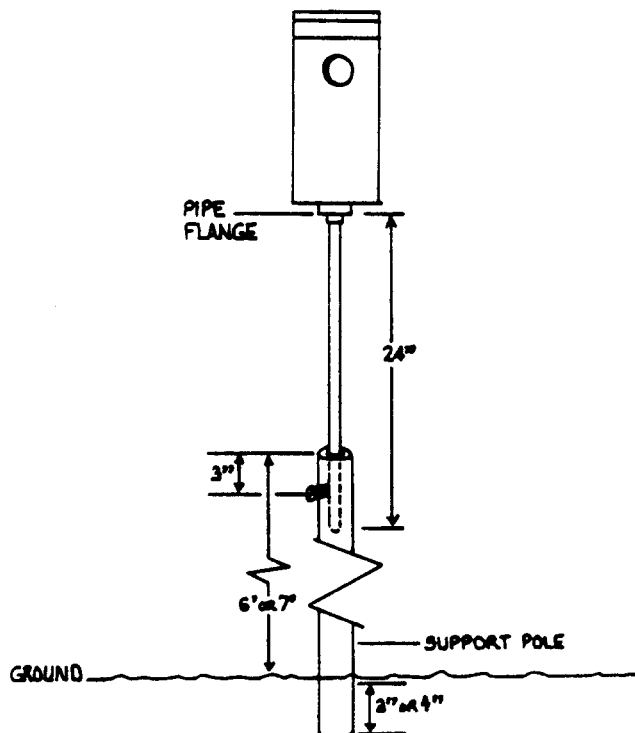


Figure 2. Nest boxes can be mounted on pipe flange assemblies. This allows for quick and easy removal for winter storage in addition to the ability to readily raise or lower nest box height.

Wood power or telephone poles, when located in the right places, are often suitable for mounting a tree swallow nest box; however, permission should be obtained from the utility company before this is done. If a utility company objects to nails and screws, the nest box can be easily wired to the poles.

Sheet metal collars 18 inches or more in height can be wrapped around wooden poles or posts or even dead trees to keep climbing animals from getting to the houses (Figure 3). Suitable metal sheets can often be obtained at little or no cost from a printing office.

Placement

Tree swallow houses are best placed in fairly open situations near lakes and streams. Satisfactory locations include: pastures, fields, open wasteland, large lawns, country cemeteries and golf courses. Avoid placing the houses near buildings and feedlots that attract house sparrows and starlings. Standing dead trees in water near lake shores provide good sites for tree swallow nest boxes. Avoid placing tree swallow houses near areas where insecticides are widely used. Widespread use of insecticides may destroy the food supply or even the birds themselves. It is best to locate the houses away from main highways to reduce the chances of tree swallows being hit by traffic.

The height of a tree swallow house should be from 4 to 15 feet above the ground or water (distance to the bottom of the house). A good rule-of-thumb is to place the house chest-high, for this enables easy access to it for inspection and cleaning. In pastures, tree swallow houses should be placed high enough so that livestock cannot disturb them. The entrance should face an open area, preferably in a direction away from prevailing winds and cold rains. When utility poles are used as the support, the house can be attached on the east or northeast side of the pole to provide some protection from the hot afternoon sun.

In North Dakota, tree swallow houses should be in place before the first of April. Tree swallows are not very territorial and the houses can be placed quite close together, even as close as 25 feet apart.

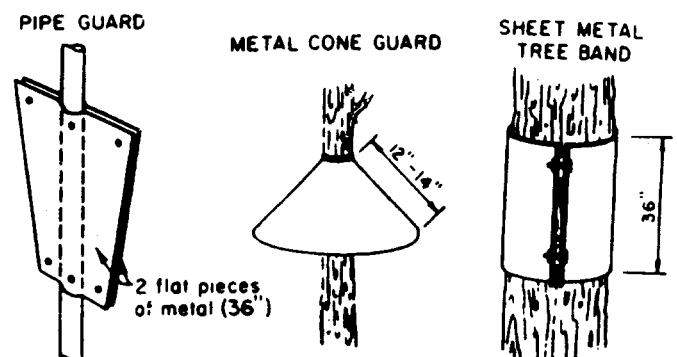


Figure 3. There are a number of ways to "predator proof" your homemade nest boxes. Above are examples of three of the more successful techniques.

The bluebird, another highly desirable and interesting species, will nest readily in houses intended for tree swallows. Bluebirds are quite territorial, but if these houses are put up in pairs about 50 to 100 feet apart, and using the recommended spacing for bluebirds of at least 100 yards between pairs of nest boxes, it is possible for paired boxes to have tree swallows in one box and bluebirds in the other. Wrens, another desirable species, will also sometimes nest in tree swallow nest boxes. This, however, can be avoided to a considerable degree if the boxes are placed away from shrubby, wooded or brushy areas.

Maintenance

Painting or staining will improve the appearance and life of any nest box even though this is not necessary. If you choose to paint or stain, use only light color such as light brown, tan, gray or green. Dark colors may cause the interior of a nest box to get too warm on hot sunny days. Raw linseed oil helps protect the wood and results in a natural finish. The inside of a nest box and inside rim of the entrance hole should never be painted or stained. **Do not use chemical wood preservatives.**

It is important that tree swallow nest boxes be built so they can be opened for inspection or cleaning. The one-board model has this feature. It is recommended that the nest material be removed and the nesting compartment be brushed out after a brood of young has left the nest. Make sure that the interior of the nest box is free of nest material or other debris as early as March or early April, just prior to the nesting season.

Squirrels or mice may use the nest boxes in winter. To prevent this, the nest box door can be left open during winter. If this is done, be sure to close it prior to the nesting season. The life of any nest box can be enhanced if it's removed and stored for the winter.

Conclusion

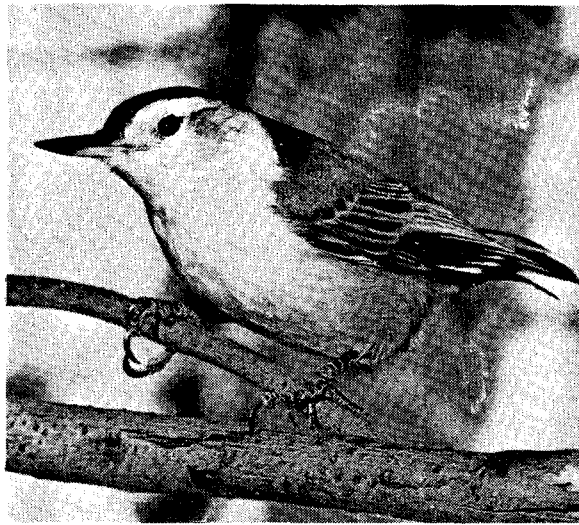
The tree swallow is one of our favorite songbirds. It is admired by old and young alike, and activities to help it can be very rewarding for individuals as well as organizations such as 4-H clubs, garden clubs, bird clubs, Boy Scouts and Girl Scouts. Sometimes such groups may set up a tree swallow trail by placing a

number of the nest boxes in a manner that they may be inspected by going from house to house. The nest boxes can be checked periodically during the nesting season to record data on nest, eggs, young, etc., and to remove any undesirable tenants or detect predation or other problems. It is best not to open the boxes when the young are 12 days or more old as they may leave the nest too soon. The young also should not be handled unless they are to be banded.

The one-board nest box has a simple design and is easy to build and if placed and maintained according to the instructions given, can provide a safe nest site for tree swallows in your area. Don't be discouraged if your homemade nest box isn't used the first year. It often takes time before tree swallows become established nesters in a locality. But, once they start using your homemade nest sites, you are well on your way to enjoying these beautiful birds annually.

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NUTHATCHES

By Terry A. Messmer and Forrest B. Lee

Life History

Both the white-breasted and red-breasted nuthatch nest in North Dakota. The white-breasted nuthatch is associated with deciduous trees and occurs in much of the state, while the red-breasted nuthatch which is more partial to evergreen trees rarely nests in the state.

White-Breasted Nuthatch

This interesting little bird is most often seen moving up, down or around tree trunks and branches, frequently uttering its "yank, yank, yank" call. The white-breasted nuthatch has a bluish-gray back and white underside, with black on the top of the head and neck. Its flanks are rusty colored. The bill is fairly long and tapers to a point.

The white-breasted nuthatch is found throughout North America, from southern Canada south to Mexico and lower California. It does not migrate and is a year-round resident wherever it is found.

The white-breasted nuthatch occurs in deciduous or mixed forests, shelterbelts, farm groves, in city parks and urban forests throughout North Dakota. It is more common in the eastern half of the state than in the west. In western North Dakota it is found mostly in river valleys.

Nests of the white-breasted nuthatch are located from 10 to 50 feet above the ground in natural tree cavities such as old woodpecker holes. The nest may be lined with feathers, fine grasses, small twigs and hairs.

In North Dakota the period of nesting is from late April to August. The clutch usually contains from six to nine white eggs speckled with brown. The incubation period is about 12 days. Only one brood

is reared each year. The female does the incubating, however the male feeds her during egg-laying and incubation, and assists with feeding the young. The young are able to fly at about two weeks of age.

The food of the white-breasted nuthatch consists mostly of insects or insect eggs found in trees, i.e., plant lice, scale insects or caterpillars. Besides insects they eat seeds such as ragweed or sunflower. Throughout the year it may be seen searching for food on tree trunks or on branches, moving up, down and sideways. Often it descends a tree trunk headfirst.

Red-Breasted Nuthatch

The red-breasted nuthatch is closely associated with conifers. It is a dainty little bird somewhat smaller than the white-breasted nuthatch. The back is bluish-gray and the underside is reddish or rust colored. It has a dark stripe through the eye which is bordered above by white. It searches for food among the tree branches. Like the white-breasted nuthatch it will travel headfirst down the trunk of a tree.

The red-breasted nuthatch nests from Alaska east through Canada to Newfoundland and south through the coniferous forests of the northern United States. It winters from southern Canada to lower California and the Gulf Coast.

The red-breasted nuthatch is a fairly common spring and fall migrant through North Dakota and winters in spruce trees or other evergreens. There are few nesting records for the state.

The nest is in a cavity in a tree or stump. It may be an abandoned woodpecker hole or in a hole excavated by the red-breasted nuthatch in the rotting wood of stumps or snags, birch or aspen. The nest is lined with grasses, shreds of bark and other soft

materials and is usually less than 20 feet above the ground. The diameter of the entrance hole is about 1½ inches. Both sexes bring resin which is placed around the entrance hole. This may be done to deter other birds or animals from entering the nest cavity.

The nesting period commences in May. The clutch usually contains five or six eggs which are white speckled with brown. The incubation period is about 12 days. Only one brood is reared each year. The female incubates the eggs, but the male assists with feeding the young. The young are able to fly at 14 to 20 days of age.

The food of the red-breasted nuthatch is mostly insects and their eggs. Spruce or pine seeds are also eaten.

General Considerations

Both species of nuthatches will accept almost any kind of a nest box that they can enter, and plans are available for a number of types. Several factors should be considered when deciding on what kind of nest box to buy or build. These include size of entrance hole and interior, adequate ventilation and drainage, and the ability to open the house for examination and cleaning. The recommended inside floor dimensions are from 4×4 inches to 5×5 inches or if not square an equivalent number of square inches. The inside depth from bottom to top should be from 8 to 10 inches. The distance from the floor to the bottom of the entrance hole should be from five to seven inches on the inside. Two or more ¼-inch ventilation holes should be drilled near the top of the

front or side boards. The bottom board should have three or four ¼-inch or 3/16-inch drainage holes. The inside of the front board should be roughened for 3 inches below the entrance hole to provide footing for the young birds at the time they leave the nest. **No perch of any kind should be attached to the nest box.** Sparrows may be attracted by the perch and it is not needed by nuthatches.

Nuthatches are fully satisfied with nest boxes of simplest design as long as these basic requirements are met. The nest box should be made of wood. Almost any kind of wood will do, such as that from old crates or boxes and scrap lumber which is often available at little or no cost from lumber yards or building contractors. Pine lumber and exterior grade plywood of ¾-inch thicknesses are both excellent. (The actual thickness of 1-inch standard dimension lumber is about ¾-inch.)

The entrance may be a round hole 1¼ inches to 1½ inches in diameter. While various kinds of nest boxes give satisfactory results we recommend one of simple design that is easy to construct. The "one-board" nest box can be made from a single 4-foot piece of 1-inch by 6-inch lumber.

"One-Board" Nuthatch Nest Box

Materials Needed

- Lumber - A single piece of 1-inch by 6-inch by 4-foot standard dimension lumber. The actual width of a 6-inch board is 5½ inches.
- Nails - About 18 galvanized box nails.
- Sawdust - Enough sawdust to provide a depth of 1 inch in the bottom of the nestbox.

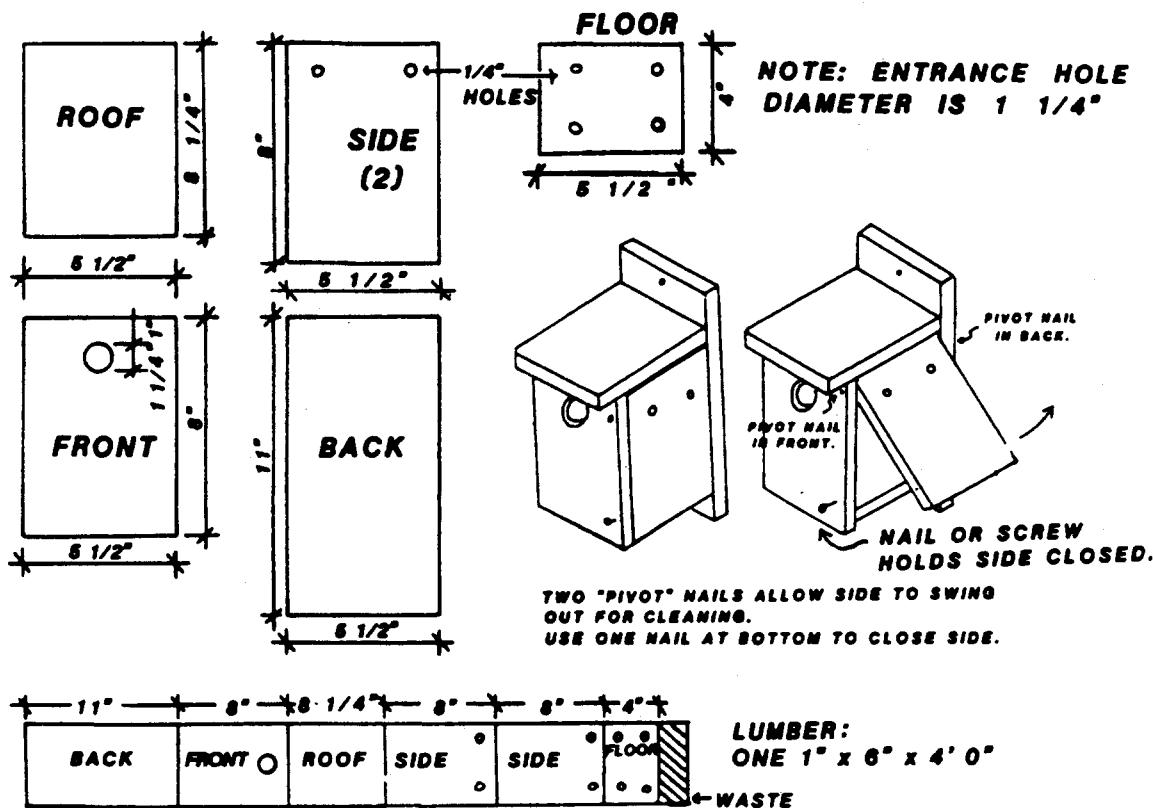


Figure 1. One-Board Nuthatch Nest Box Plan

Construction

First measure and cut pieces to proper length from the four foot piece of lumber as follows; (Figure 1):

Front-one piece 5½ inches by 8 inches.

Back-one piece 5½ inches by 11 inches.

Sides-two pieces 5½ inches by 8 inches with two ¼-inch ventilation holes in each near the top.

Floor-one piece 4 inches by 5½ inches with four ¼-inch drainage holes as shown.

Roof-one piece 5½ inches by 8¼ inches.

Next drill the 1¼-inch diameter entrance hole in the front piece. The top of the entrance hole is 1 inch below the top of the front piece. The 1¼-inch hole also allows use by chickadees and wrens but not house sparrows and starlings. Now assemble and nail solidly in place all components except for one side. The floor piece should be recessed ¼ inch above the level of the bottom.

Fit the remaining side piece in place and drive two pivot nails, one through the back piece and one through the front piece about 2 inches from top. These allow the side to swing open for cleaning. Last, drill one hole on this side near lower edge of front piece and insert nail in hole and drive into the side piece. This nail is pulled out in order to lift side piece to inspect or clean the cavity. A second nail may be used on the back side so that if one nail would come out of place the side would still be held in place. About an inch of sawdust should be placed in the bottom of the nest box.

Mounting the Nest Box

Nuthatch nest boxes can be mounted in several ways depending on the type of nest box and what kind of supports are available. They may be attached to existing wood or metal fence posts, power or telephone poles; or on wood or metal posts, or pieces of pipe driven in place especially for this purpose.

The nest boxes are sometimes mounted on top of a length of pipe one end of which is driven into the ground far enough so the pipe is rigid. In this case a threaded pipe flange is attached to the bottom piece with bolts or screws (Figure 2). The end of the piece of pipe which extends above the ground is threaded, and the nest and support pipe are engaged by simply screwing the end of the pipe into the pipe flange applying enough pressure so it will not work loose.

Galvanized ½-inch or ¾-inch water pipes provide excellent support, and pipe flanges for pipes of these sizes are readily available at hardware stores.

The one-board nest box can be attached to a wood support with either nails or lag screws and washers through the upper and lower extensions.

Small holes drilled through the extensions make it easier to start the nails or lag screws without cracking the board. The nest box is held in the desired position while a hammer or wrench is used to anchor it firmly in place.

The one-board nest box can be attached to a metal post or pipe by threading wires through holes in the upper and lower extensions and tightening the wires so there is a firm fit. Another way is to use U-bolts

which fit around the steel post or pipe, with threaded ends through holes in the extensions. Washers are used, and the nuts are tightened so the nest box is held firmly in place.

Both the upper and lower extensions can be omitted when a pipe flange will be used. Grease spread on the support pipe will keep cats, raccoons, squirrels and other animals from climbing up to the nest box.

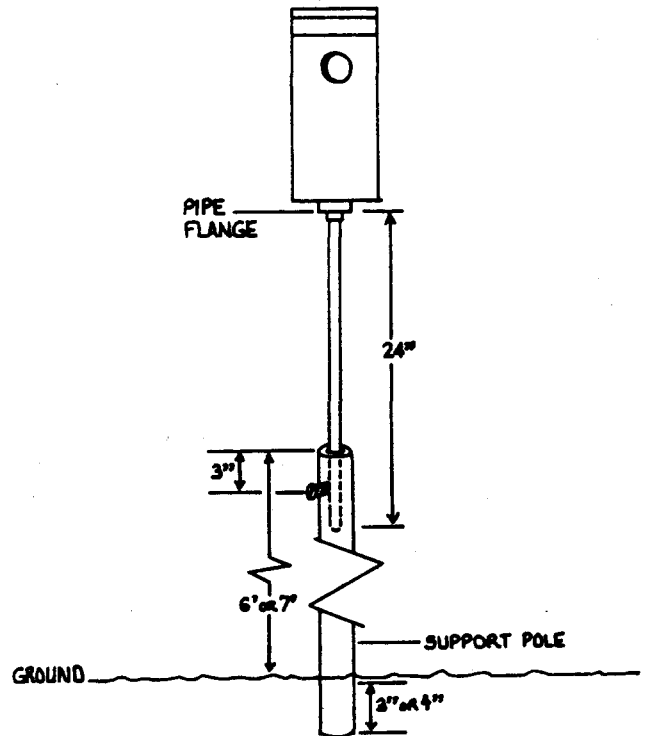


Figure 2. Nest boxes can be mounted on pipe flange assemblies. This allows for quick and easy removal for winter storage in addition to the ability to readily raise or lower nest box height.

The nest boxes may also be attached to the trunks of trees but, except for dead trees standing in water, this method is generally considered the least desirable. This is because of the greater danger to the nesting birds from tree-climbing animals like raccoons and cats.

Wood power or telephone poles when located in the right places are often suitable for mounting a nest box; however, permission should be obtained from the utility company before this is done. If a utility company objects to nails and screws, the nest box can be easily wired to the poles.

Sheet metal collars 18 inches or more in height can be wrapped around wooden poles or posts, or even dead trees to keep climbing animals from getting to the houses. Suitable metal sheets can be obtained at little or no cost from a newsprint office (Figure 3).

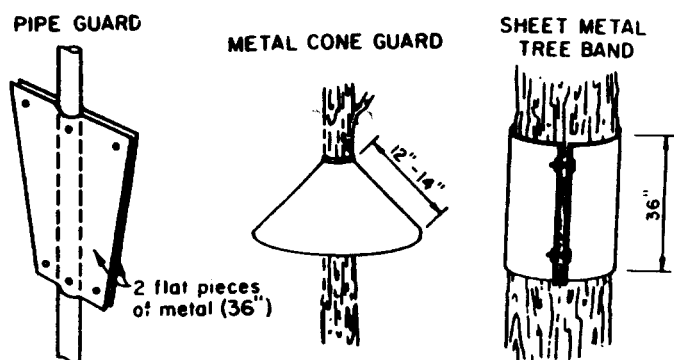


Figure 3. There are a number of ways to "predator proof" your homemade nest boxes. Above are examples of three of the more successful techniques.

Placement

For white-breasted nuthatches the nest box should be mounted 10 to 20 feet above ground in mature hardwood stands in woodlots, shelterbelts and other forested areas. They can also be placed near or at woodland clearings or the edge of woods. The nest box should be in place before the first of April. The site should be partially shaded. A good rule of thumb is to place the nest boxes about 10 feet high for this enables easy access for inspection and cleaning. The entrance should face an open area, preferably in a direction away from prevailing winds and rains. When utility poles are used as the support, the nest box can be attached on the east or northeast side of the pole to provide some protection from the hot afternoon sun.

These same placement guidelines apply for the red-breasted nuthatch except that this species is more partial to conifer or mixed conifer-hardwood stands.

Maintenance

Painting or staining will improve the appearance and life of any nest box even though this is not necessary. If you choose to paint or stain, use only light colors such as light brown, tan, gray or green. Dark colors may cause the interior of a nest box to get too warm on hot sunny days. Raw linseed oil helps protect the wood and results in a natural finish. The inside of a nest box and inside rim of the entrance hole should never be painted or stained. **Do not use chemical wood preservatives.**

It is important that nuthatch nest boxes be built so they can be opened for inspection or cleaning. The one-board model has this feature. It is recommended that the nest material be removed and the nesting compartment be brushed out after a brood of young has left the nest. Make sure that the interior of the nest box is free of nest material or other debris as early as March or early April, just prior to the nesting season.

Squirrels or mice may use the nest boxes in winter. To prevent this, the nest box door can be left open during winter. If this is done, be sure to close it prior to the nesting season. The life of any nest box can be enhanced if it is removed and stored for the winter.

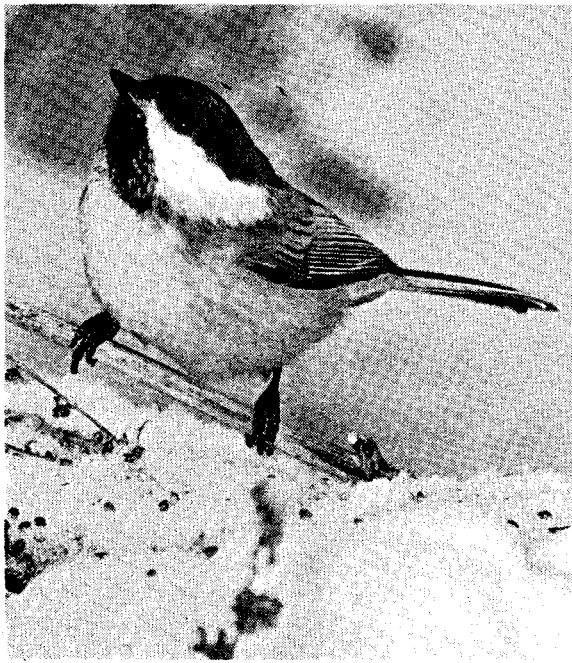
Conclusion

Nuthatches are one of our favorite birds. They are admired by old and young alike, and activities to help them can be very rewarding for individuals as well as organizations such as 4-H clubs, garden clubs, bird clubs, Boy Scouts and Girl Scouts.

The one-board nest box has a simple design and is easy to build and if placed and maintained according to the instructions given, can provide a safe nest site for nuthatches in your area. Don't be discouraged if your homemade nest box isn't used the first year. It often takes time before these birds become established nesters in a locality. But, once they start using your homemade nest sites, you are well on your way to enjoying these interesting birds annually.

References and Other Sources of Information on Nuthatches

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BLACK-CAPPED CHICKADEE

By Terry A. Messmer and Forrest B. Lee

Life History

This round, fluffy bird is well known since its markings, voice and habits often make it quite conspicuous. As its name suggests it has a black cap across its head and a black throat. It has white cheeks, gray back, and dull white underparts.

Among its call notes is the well-known chicka, dee-dee. It has another call that is a clear, sweet whistle sounding like feebee. Still another note is a delicate prolonged jingling like tiny sleigh bells.

Chickadees often seem very trustful of people and will flit about in a tree, making short flights from twig to twig when someone is near. They have been described as "friendly" and "cheerful."

These birds nest in woodlands in North America from the northern limit of trees south to the central United States. They generally are not migratory but in winter they may congregate in small loose flocks which rove about in forests or wooded suburban areas.

The black-capped chickadee is a common bird in North Dakota. It breeds in deciduous woodlands in many parts of the state including the Turtle Mountains and forests along streams and lakes. In winter they frequent feeding stations in towns and cities as well as in rural areas.

The nest is usually located in natural cavities in deciduous trees. In areas where birches are found, the chickadee will make its own nest in a hole in a dead stub or branch by removing decaying wood to form a cavity. Nests have been found from 4 to 15 feet above

the ground. The nest cavity may be lined with warm materials such as plant fibers, hairs, wool, mosses and feathers. The nesting period in North Dakota is from late April to mid-July.

The clutch usually contains from six to eight white eggs speckled with brown. The incubation period is about 12 days. The male feeds the female during incubation and the both parents feed the young.

A major proportion of the food of chickadees is made up of insects and spiders, including plant lice, scale insects, and moths and their eggs. Some seeds, berries and wild fruits are also eaten.

We can help chickadees by providing nesting boxes for them.

General Considerations

Chickadees will accept almost any kind of nest box that they can enter, and plans are available for a number of types. Several factors should be considered when deciding on what kind of nest box to buy or build. These include size of entrance hole and interior, adequate ventilation and drainage, and the ability to open the house for examination and cleaning. The recommended inside floor dimensions are from 4×4 inches to 5×5 inches or if not square an equivalent number of square inches. The inside depth from bottom to top should be from 8 to 10 inches. The entrance may be a round hole 1 1/8 inches to 1 1/2 inches in diameter. The distance from the floor to the bottom of the entrance hole should be from 5 to 7 inches on the inside. Two or more 1/4-inch ventilation holes should be drilled near the top of the front or side boards. The bottom board should have

three or four $\frac{1}{4}$ -inch or $\frac{3}{16}$ -inch drainage holes. The inside of the front board should be roughened for 3 inches below the entrance hole to provide footing for the young birds at the time they leave the nest. **No perch of any kind should be attached to the nest box.** Sparrows may be attracted by the perch and it is not needed by the chickadees.

Chickadees are fully satisfied with nest boxes of simplest design, as long as these basic requirements are followed closely. We recommend that the nest boxes be made of wood. Almost any kind of wood will do, such as that from old crates or boxes and scrap lumber which often is available at little or no cost from lumber yards or building contractors. Pine lumber and exterior grade plywood of $\frac{3}{4}$ -inch thickness are both excellent. (The actual thickness of 1-inch standard dimension lumber is about $\frac{3}{4}$ inch.)

While various kinds of chickadee nest boxes give satisfactory results we recommend one of simple design that is easy to construct. It is the "one-board" nest box which can be made from a single 4-foot piece of 1-inch by 6-inch lumber. Following are instructions for building one of these nest boxes.

"One-Board" Black-Capped Chickadee Nest Box

Materials needed

- Lumber - A single piece of 1-inch by 6-inch by 4-foot standard dimension lumber. The actual width of a 6-inch board is 5½ inches.
- Nails - About 18 galvanized box nails.

Construction

First measure and cut pieces to proper length from the four foot piece of lumber as follows (Figure 1):

Front-One piece 5½ inches by 8 inches.

Back-One piece 5½ inches by 11 inches.

Sides-Two pieces 5½ inches by 8 inches with two $\frac{1}{4}$ -inch ventilation holes in each near the top.

Floor-One piece 4 inches by 5½ inches with four $\frac{1}{4}$ -inch drainage holes as shown.

Roof-One piece 5½ inches by 8¼ inches.

Next drill the $\frac{1}{4}$ -inch diameter entrance hole in front piece. The top of the entrance hole is 1 inch below top of front piece. Chickadees need an entrance hole $1\frac{1}{8}$ inch in diameter. The $\frac{1}{4}$ -inch hole which we recommend allows use by wrens and nuthatches but not house sparrows and starlings. Now assemble and solidly nail all components in place except for one side. The floor piece should be recessed $\frac{1}{4}$ inch above the level of the bottom.

Then fit remaining side piece in place and drive two pivot nails. One through backpiece and one through front piece and about two inches from top. These allow the side to swing open for cleaning.

Last, drill one hole on this side near lower edge of front piece and insert nail in hole and drive into side piece. This nail is pulled out in order to lift side piece to inspect or clean the cavity.

A second nail may be used on the back side so that if one nail would come out of place the side would still be held in place. About an inch of sawdust should be placed in the bottom of the nest box.

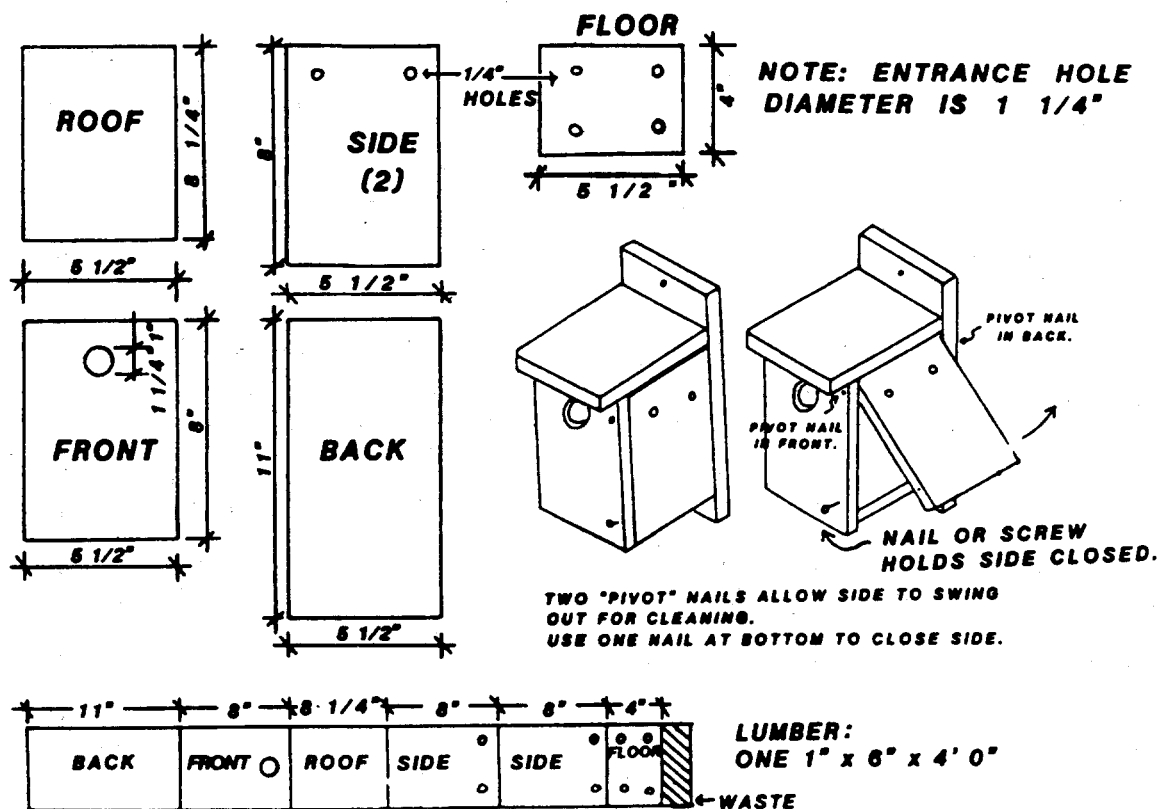


Figure 1. One-Board Chickadee Nest Box Plan

Mounting the Nest Box

Chickadee nest boxes can be mounted in several ways depending on the type of nest box and what kind of supports are available. They may be attached to existing wood or metal fence posts, power or telephone poles, or on wood or metal posts or pieces of pipe driven in place especially for this purpose.

The one-board nest box is attached to a wood support with either nails or lag screws and washers through the upper and lower extensions.

Small holes drilled through the extensions make it easier to start the nails or lag screws without cracking the board. The nest box is held in the desired position while a hammer or wrench is used to anchor it firmly in place.

The one-board nest box can be attached to a metal post or pipe by threading wires through holes in the upper and lower extensions and tightening the wires so there is a firm fit. Another way is to use U-bolts which fit around the steel post or pipe, with threaded ends through holes in the extensions. Washers are used, and the nuts are tightened so the house is held firmly in place.

Chickadee nest boxes are sometimes mounted on top of a length of pipe one end of which is driven into the ground far enough so the pipe is rigid. In this case a threaded pipe flange is attached to the bottom piece with bolts or screws (Figure 2). The end of the piece of pipe which extends above the ground is threaded, and the nest and support pipe are engaged by simply screwing the end of the pipe into the pipe flange and applying enough pressure so it will not work loose.

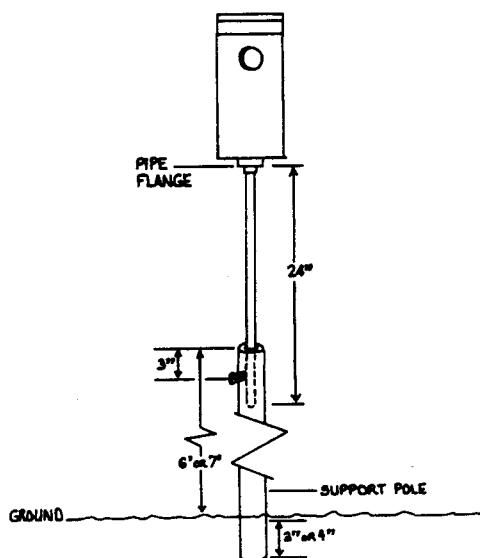


Figure 2. Nest boxes can be mounted on pipe flange assemblies. This allows for quick and easy removal for winter storage in addition to the ability to readily raise or lower nest box height.

Galvanized $\frac{1}{2}$ -inch or $\frac{3}{4}$ -inch water pipes provide excellent support, and pipe flanges for pipes of these sizes are readily available at hardware stores.

Both the upper and lower extensions can be omitted when a pipe flange will be used. Grease, spread on the support pipe, will keep cats, raccoons, squirrels and other animals from climbing up to the house.

Chickadee nest boxes may also be attached to the trunks of trees but, except for dead trees standing in water, this method is generally considered the least desirable because of the greater danger to the nesting birds from tree-climbing animals like raccoons and cats.

Wood power or telephone poles when located in the right places are often suitable for mounting chickadee nest box; however, permission should be obtained from the utility company before this is done. If a utility company objects to nails and screws, the nest box can be easily wired to the poles.

Sheet metal collars 18 inches or more in height can be wrapped around wooden poles or posts or even dead trees to keep climbing animals from getting to the houses. Suitable metal sheets can be obtained at little or no cost from a newsprint office (Figure 3).

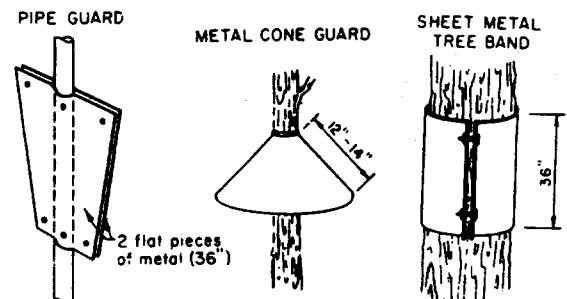


Figure 3. There are a number of ways to "predator proof" your homemade nest boxes. Above are examples of three of the more successful techniques.

Placement

The house should be mounted 5 to 15 feet above ground in mature hardwood stands in woodlots, shelterbelts and other forested areas. They can also be placed near or at woodland clearings or the edge of woods. The house should be in place before the first of April. The site should be partially shaded with 40 to 60 percent sunlight. A good rule of thumb is to place them chest-high for easy access for inspection and cleaning. In pastures, chickadee houses should be placed high enough so that livestock cannot disturb them. The entrance should face an open area, preferably in a direction away from prevailing winds and rains. When utility poles are used as the support, the nest box can be attached on the east or northeast side of the pole to provide some protection from the hot afternoon sun.

Maintenance

Painting or staining will improve the appearance and life of any nest box even though this is not necessary. If you choose to paint or stain, use only light colors such as light brown, tan, gray or green. Dark colors may cause the interior of a nest box to get too warm on hot sunny days. Raw linseed oil helps protect the wood and results in a natural finish. The inside of a nest box and inside rim of the entrance hold should never be painted or stained. **Do not use chemical wood preservatives.**

It is important that chickadee nest boxes be built so they can be opened for inspection or cleaning. The one-board model has this feature. It is recommended that the nest material be removed and the nesting compartment be brushed out after a brood of young has left the nest. One should make sure that the interior of the nest box is free of nest material or other debris as early as March or early April, just prior to the nest season.

Squirrels or mice may use the nest boxes in winter. To prevent this, the nest box door can be left open during winter. If this is done, be sure to close it prior to the nesting season. The life of any nest box can be enhanced if it is removed and stored for the winter.

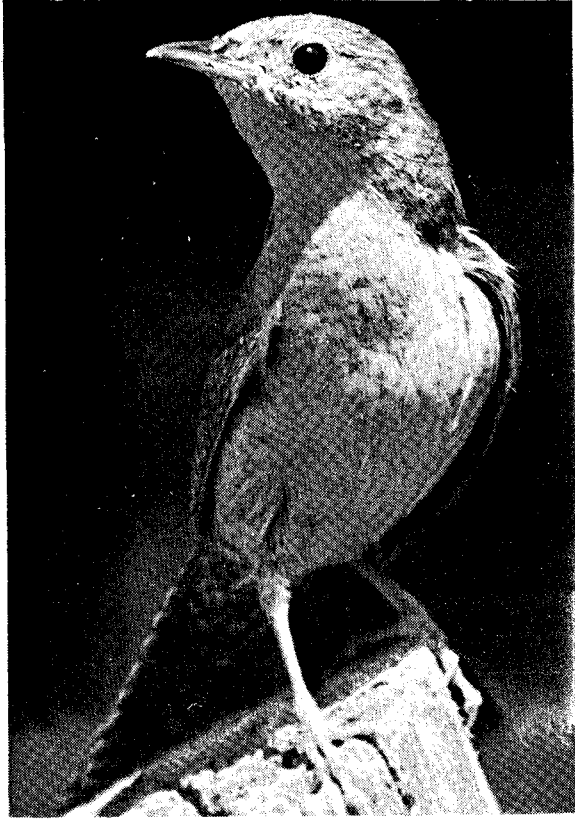
Conclusion

The chickadee is one of our favorite birds. It is admired by old and young alike, and activities to help it can be very rewarding for individuals as well as organizations such as 4-H clubs, garden clubs, bird clubs, Boy Scouts and Girl Scouts.

The one-board nest box has a simple design and is easy to build and if placed and maintained according to the instructions given, can provide a safe nest site for chickadees in your areas. Don't be discouraged if your homemade nest box isn't used the first year. It often takes time before chickadees become established nesters in a locality. But, once they start using your homemade nest sites, you are well on your way to enjoying these interesting birds annually.

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HOUSE WREN

By Terry A. Messmer and Forrest B. Lee

Life History

The house wren is a small brown bird whose presence is very conspicuous wherever it occurs. It is a nervous, fussy, chattering little fellow that is at home near people. Originally it lived in the forests or forest edges and clearings but now it is also often found in or near cities, towns, farms or other places where people live or work. Its song in early morning is a familiar sound to many people.

House wrens occur throughout North Dakota. They nest over a large portion of North America from southern Canada to southern Mexico. They spend the winter in southern United States and in Mexico.

The nest is usually in a cavity in a tree, stump, fencepost or in a nest box provided for them. They are known to nest in strange places like a mail box or the pocket of an old coat hanging in a shed. They are inquisitive and will explore nooks and crannies in their search for a place to build a nest.

Nest building usually commences in late May. The nest is made of twigs and sticks, with the nest proper of softer materials such as grasses, plant fibers and feathers. The clutch usually contains from six to ten dull-white eggs which are speckled with small brownish dots. Females usually return to the same nest site.

The food of house wrens is almost entirely insects, including grasshoppers, caterpillars, moths, weevils and many other kinds.

House wrens like cavity nesting boxes and can be attracted to nest boxes in almost any backyard. Following are plans and guidelines for building and erecting nest boxes for house wrens.

House Wren Nest Box

House wrens will accept almost any kind of nest box that they can enter, and plans are available for a number of types. Several factors should be considered when deciding on what kind of nest box to build. These include size of entrance hole and interior, adequate ventilation and drainage, and the ability to open the house for examination and cleaning. The recommended inside floor dimensions are from 4×4 inches to 5×5 inches, preferably the former. The inside depth from bottom to top should be from 6 to 8 inches. The distance from the floor to the bottom of the entrance hole should be from 4 to 6 inches on the inside. Two or more ventilation holes should be provided near the top of the front or side boards. The bottom should have two or more 1/4-inch or 3/16-inch drainage holes. No perch of any kind should be attached to the nest box. Sparrows may be attracted by the perch and it is not needed by the wrens.

House wrens are fully satisfied with nest boxes of simplest design, as long as these basic requirements are met. Wren nest boxes should be made of wood. Almost any kind of wood will do, such as that from old crates or boxes and scrap lumber which often is available at little or no cost from lumber yards or building contractors. Pine lumber and exterior grade plywood of $\frac{3}{4}$ -inch thickness are both excellent. The actual thickness of 1-inch standard dimension lumber is about $\frac{3}{4}$ inch.

The entrance may be a round hole 1 to $1\frac{1}{4}$ inches in diameter or an oval opening 1 inch wide and $1\frac{1}{4}$ inches high.

While various kinds of wren nest boxes give satisfactory results we recommend one of simple design that is easy to construct. Following are instructions for building one of these nest boxes.

Material Needed

- 1 - Piece 1 inch \times 6 inch (actually $\frac{3}{4}$ inch \times $5\frac{1}{2}$ inches) \times 24 inches
- 1 - Piece 1 inch \times 4 inch (actually $\frac{3}{4}$ inch \times $3\frac{1}{2}$ inches) \times 12 inches. (Optional Mount)

This lumber can be standard dimension pine, cedar, redwood or other kind of wood.

- 2 - Top pieces 7 inches \times 7 inches of box lumber, exterior plywood, bevel siding or heavy asphalt roofing.
- 4 - Roundhead wood screws to attach one side of roof in a manner to permit removal for cleaning house.
- 9 - $1\frac{3}{4}$ inch to $2\frac{1}{4}$ inch nails.
- 8 - $1\frac{1}{4}$ inch nails.

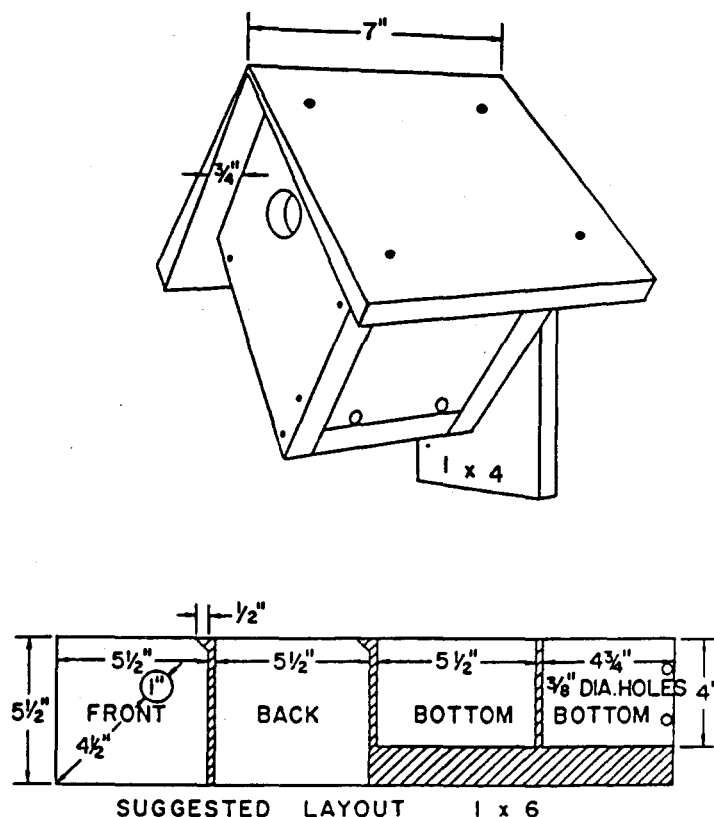
Construction

Cut the 1 inch \times 6 inch \times 24 inch board as follows (Figure 1):

- 1 - Front piece, $5\frac{1}{2}$ inches \times $5\frac{1}{2}$ inches with 1 inch diameter entrance hole located as shown in plan. The distance from the lower tip of the front piece to the lower edge of the entrance hole is $4\frac{1}{2}$ inches. One-half inch of upper tip of front and back piece is removed as shown in plan.
- 1 - Back piece, $5\frac{1}{2}$ inches \times $5\frac{1}{2}$ inches.
- 1 - Bottom piece, $5\frac{1}{2}$ inches \times 4 inches.
- 1 - Bottom piece, $4\frac{3}{4}$ inches \times 4 inches with two $\frac{3}{8}$ inch diameter holes at one end as shown in plan.

Now assemble the four pieces as shown in plan. Holes should be drilled for nails to avoid cracking of wood.

Figure 1. House Wren Nest Box.





Next, attach roof pieces allowing $\frac{3}{4}$ inch of the pieces to extend out from the front piece. One side is nailed firmly in place and other side is attached with wood screws, so it can be removed for cleaning the nest box.

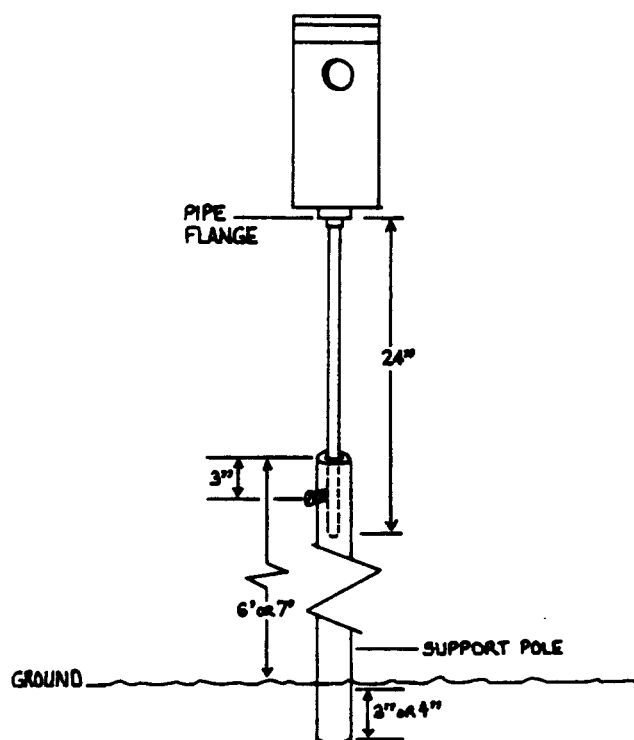


Figure 2. Nest boxes can be mounted on pipe flange assemblies. This allows for quick and easy removal for winter storage in addition to the ability to readily raise or lower nest box height.

The use of a 1 inch \times 4 inch \times 12 inch mounting piece is optional. If used, it is attached with nails or wood screws. It is not needed if the house is going to be suspended free-hanging from eye-screws in the top. Otherwise the optional mounting piece is very useful for attaching the nest box to a building, tree, post or pole.

Attaching or Mounting the Nest Box

Wren nest boxes can be mounted in several ways depending on the type of box and what kind of supports are available. The box described can be suspended free-hanging from one or two eye-screws in the top. When this method is used, pieces of wire are threaded through the eye-screws and around a branch or other support.

When the optional 1 inch \times 4 inch \times 12 inch back piece is used, the box may be attached to an existing wood or metal fence post, power or telephone pole, or on posts or pipes driven in place especially for this purpose.

The nest box is attached to a wood support with either nails or lag screws and washers through the back piece. Small holes drilled through the back piece make it easier to start the nails or lag screws without cracking the mounting board. The wren nest box can be attached to a metal post or pipe by threading wires through holes in the back piece and tightening so there is a firm fit. Another way is to use a U-bolt which fits around the steel post or pipe, with threaded ends through holes in the back piece. Washers are used and the nuts are tightened so the house is held firmly in place (Figure 2).

Sheet metal collars 18 inches or more in height can be wrapped around the wooden poles or posts or even dead trees to keep climbing animals from getting to the house (Figure 3). Suitable metal sheets can be obtained at little or no cost from a newsprint office.

Placement

Wren nest boxes can be located in a variety of situations around a yard or farmstead. They can be placed under the eaves of a shed or other building, or in a shrub or tree 4 to 10 feet above the ground. Place the box close to or actually in the cover of the shrub or tree. Lilac bushes or plum trees are examples of good locations for a wren nest box. A good rule-of-thumb is to place the house chest-high for this enables easy access to it for inspection and cleaning. If possible, face the entrance in a direction away from prevailing winds and cold rains.

In North Dakota, wren nest boxes should be in place by mid-April.

Maintenance

Starlings and sparrows cannot enter the box through the 1-inch diameter entrance hole so they generally are not a problem. The boxes should be opened and cleaned out each year before the beginning of the nesting season.

Paint will improve the appearance and life of the house even though this is not necessary. Use only light colored paint or stain. A 1:1 mixture of raw linseed oil and turpentine helps protect the wood and results in a natural finish.

The life of the nest box can be enhanced if you remove and store the house rather than leaving it exposed in winter weather.

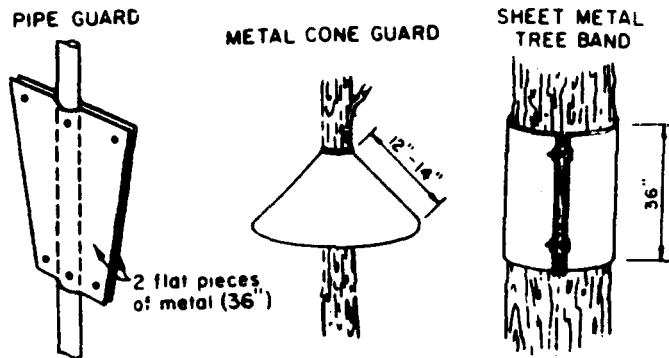


Figure 3. There are a number of ways to "predator proof" your homemade nest boxes. Above are examples of three of the more successful techniques.

Conclusion

The house wren is one of our favorite songbirds. It is enjoyed by old and young alike, and its presence adds much to a pleasant summer day. Don't be discouraged if your nest box isn't used the first year. It often takes time before wrens become established.

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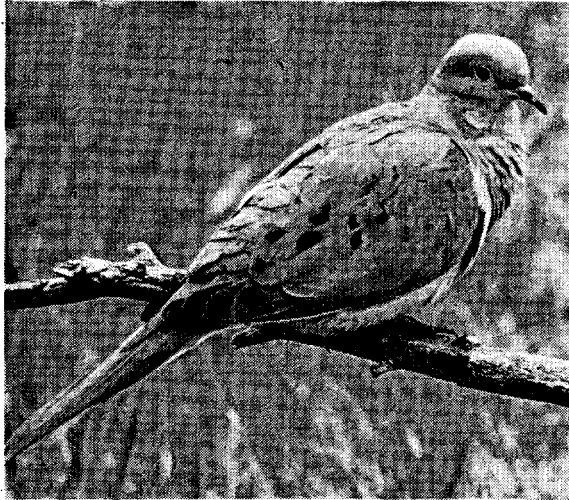
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MOURNING DOVE

By Terry A. Messmer and Forrest B. Lee

Life History

The mourning dove gets its name from its beautiful call which is a soft, mournful, resonant sound that might be described as coo, ah coo, coo-coo. This most welcome sound can be heard throughout the day but is especially noticeable at daybreak and dusk. It will often be perched on a high branch or wire when calling.

The mourning dove is about the size of a robin. Its back is brownish-gray with an olive cast. The underside is white with a purplish cast. It has a black spot behind and a little below each eye. The tail is long and somewhat pointed with white edging near the tips of the main feathers. The wings make a whistling sound when the mourning dove is in flight.

The nesting range extends from southern Canada throughout much of the United States and Mexico. It spends the winter from the southern states south to western Panama.

In North Dakota, the mourning dove is an abundant summer resident which breeds throughout the state in many habitats. It is found in cities and towns, around farmsteads, in shelterbelts and open woods, and in edge areas near prairie or grasslands. Sometimes it is found in fields and grasslands far from trees.

The nest is most often built in trees, but sometimes is on the ground. A variety of trees are used.

The nest is usually a frail, flat structure built on limbs or in crotches of trees. It is made of small sticks and twigs and has little or no lining.

Mourning doves may raise more than one family of young during the nesting season. In North Dakota

mourning doves nest from April through September. The usual clutch is two white eggs. The incubation period is from 13 to 15 days, and the young are in the nest from 12 to 15 days before they are able to fly. The young are fed by both parents on a milk-like substance which is secreted by a membrane in the crop. The young dove inserts its bill into the mouth of the parent to feed.

The food of mourning doves is almost entirely of vegetable matter. A wide variety of weed seeds are eaten as well as some small grains. In late summer, small flocks sometimes feed on seeds along the edges of roads. They frequently fly to water to drink. The mourning dove is a game bird in North Dakota and it is sometimes hunted at watering holes. The mourning dove is a valuable destroyer of weed seeds.

Mourning Dove Nesting Cone

We can help mourning doves by providing safe nesting places for them. This is done by attaching a piece of hardware cloth in the crotch or fork of a tree, on an evergreen bough, or other place where it likes to nest. The piece of hardware cloth is shaped so it has a hollow depression. When a nest is built on one of these shallow nest cones, it is less likely to be damaged or destroyed by wind, hail or other inclement weather.

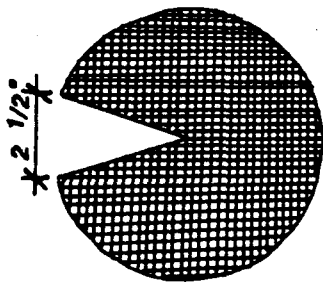
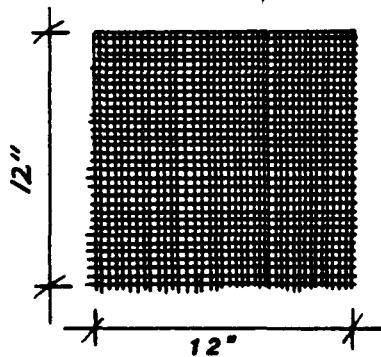
Materials Needed

1 - 12-inch square piece of $\frac{1}{4}$ - or $\frac{1}{2}$ -inch mesh hardware cloth or a 12-inch square piece of composition asphalt shingle.

Construction

With a tin snips trim the 12-inch square piece of hardware cloth or asphalt shingle to form a circle 12 inches in diameter. Next, cut out a narrow pie-shaped

Figure 1. Plan for Mourning Dove Nest Cone



wedge from the circle which is about $2\frac{1}{2}$ inches wide at the outer edge of the circle. Then, pull the two cut edges together and overlap them about 1 inch. If asphalt shingle is used, cut out a 1-inch diameter circle in the center of the cone to allow for drainage. Last, wire or staple the two edges together to form a shallow cone (Figure 1).

Attaching the Nest Cone

The nest cone should be secured firmly in place using wire, cord, staples, roofing nails or whatever is appropriate for the situation. Bend back the edges of

the cone so that the sharp points of wire do not stick out.

Placement

Place the nest cone in moderate shade in the crotch of a horizontal tree limb from 5 to 15 feet above the ground. Suitable crotches can be found in both evergreen and deciduous trees. Be sure to pick a place where the nest will be somewhat sheltered in case of a storm and/or high winds. There should be open space around the nest cone for easy access by the doves.

As was previously pointed out, the mourning dove nests in trees throughout the state both in towns and in the country in a variety of habitats including shelterbelts, woodlots, cemeteries, golf courses, house yards and farm yards.

Maintenance

The mourning dove nest cone requires very little maintenance after it is installed in place. It is a good idea to check the cones before the beginning of the nesting season to be sure they are in good repair and are still attached firmly in place. If some of your nesting cones are not used or are used but the eggs or young do not survive because of weather or other causes, it would be advisable to try them at another location the next year.

Conclusion

The mourning dove is a very adaptable and interesting bird with a beautiful song. It is possible to attract them to your home or wherever they are desired by providing nest cones. This simple and inexpensive nest cone is an excellent one for young people to make in nature classes.

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